



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

LANE MEDICAL LIBRARY STANFORD STOR
L71 J77 1894
The physiological factor in diagnosis :



24503305014

LANE

MEDICAL



LIBRARY

GIFT

DR. H. C. MOOREHEAD

Gardner

THE PHYSIOLOGICAL FACTOR

IN

DIAGNOSIS.

THE
PHYSIOLOGICAL FACTOR
IN
DIAGNOSIS.

A Work for Young Practitioners.

BY
J. MILNER FOTHERGILL, M.D.,
PHYSICIAN TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE
CHEST (VICTORIA PARK),
HON. M.D. RUSH COLL., ILL.,
ASSOCIATE FELLOW OF THE COLLEGE OF PHYSICIANS, PHILADELPHIA.

SECOND EDITION.

'Skill consists of a foundation of common-sense and a superstructure
of special education.'

NEW YORK :
WILLIAM WOOD & COMPANY.
1884.

W

1994.11.11

F77
1884

‘When a patient places confidence in a member of the profession, puts his life, or his health, the prospects of himself, and, may be those also of his wife and children, in his hands, the least he, in turn, can do is to meet him with common honesty. If he be not entirely deserving of the confidence reposed in him, let him try to be worthy of it by doing his best. How much, however, does “doing his best” involve? It involves all that lies in his power; each man to the very best of his ability. “For unto whomsoever much is given, of him shall much be required.” “Doing his best” is taking all possible pains, which includes such information as may be attainable. Avoidable ignorance is not a worthy return for confidence.’

TO
MICHAEL FOSTER, M.D., F.R.S.,
WHO SO WORTHILY FILLS
THE CHAIR OF PHYSIOLOGY AT CAMBRIDGE,
THIS WORK
Is Dedicated
BY
THE AUTHOR.

PREFACE TO SECOND EDITION.



THE fact of an Edition of one thousand copies having been absorbed, and a Second Edition called for within three months, may be regarded as the verdict of the profession upon this work.

January 1st, 1884.

P R E F A C E .

THIS work is designed for young practitioners of medicine entering upon private practice.

The medical student is apt to believe that medical education interests only those studying medicine and those engaged in medical tuition ; and that nothing worth the having can come from others than those who are attached to medical schools. This impression may survive the medical curriculum ; but time and experience dim its outlines. In the belief that the present work supplies something that may be of value in practice, the writer lays it before the young practitioner, for his verdict ; not without some hope, however, that he may find it useful.

His thanks are again due to Dr. D. G. Johnston for his aid in revising the proof-sheets.

Aug. 1st, 1883.

110, PARK STREET,
GROSVENOR SQUARE, W.

CONTENTS.

CHAPTER	PAGE
I. THE HISTORY (1) OF THE FAMILY, (2) OF THE INDIVIDUAL - - - - -	1
II. EXTERNAL APPEARANCE - - - - -	7
III. THE TONGUE - - - - -	39
IV. THE RESPIRATION - - - - -	55
V. THE PULSE - - - - -	73
VI. THE ALIMENTARY CANAL - - - - -	101
VII. THE URINE - - - - -	123
VIII. THE REPRODUCTIVE ORGANS - - - - -	146
IX. THE TEMPERATURE - - - - -	158
X. MOTOR AND SENSORY DISORDERS - - - - -	180
XI. THE PATIENT'S SENSATIONS - - - - -	203
XII. THE PATIENT IN HIS BEDROOM - - - - -	239
XIII. CONCLUSION - - - - -	252

THE PHYSIOLOGICAL FACTOR IN DIAGNOSIS.



CHAPTER I.

THE FAMILY HISTORY. THE HISTORY OF THE INDIVIDUAL.

WHEN a patient presents himself or herself before the medical man, that patient is commonly a stranger. Everything then has to be learned about him, as well as about the malady for which the medical man is consulted.

How, then, must the young practitioner commence his examination? Some fly at the patient with a stethoscope, or call in the aid of divers instruments of precision. These latter are not to be ignored, certainly; but there is much to be done besides resorting to these valuable aids. Instruments of precision come in more fittingly at the close of the examination rather than at the beginning! When the nature and extent of the patient's disease come to be estimated, then they are of priceless value. How they are to be used is a part of medical teaching, for which so much has to be, or has been, paid; and the embryo medical man is supposed to be familiar therewith. But much precedes resort to these aids.

First, it is desirable to know something about the individual. Private patients are not mere social units, nor yet numbered entities illustrating this or that form of disease. They are human beings, with the feelings belonging thereto. Life is sweet to all: and there are few

patients who do not hold themselves as valuable lives. 'Mine is a valuable life, doctor!' is the remark of the breadwinner of the family, or of the mother of numerous offspring, or maybe of a social waif or failure! Consequently they like to see the medical man approach the case with interest, and, if possible, with sympathy. They may not be able to form a fair estimate of his knowledge; but some opinion of him they will bear away with them. It is desirable in every way that that opinion be a favourable one. And the opinion formed will greatly depend upon how the doctor goes about his examination. He may soon demonstrate his familiarity with private patients, or betray his want of acquaintance with them; a matter the patient will soon note, or that friend which usually accompanies the patient to the doctor in the first visit will certainly observe. Two brains are pitted against one. While the doctor is observing the patient, the onlooker is taking the measure of the doctor. Young practitioners sometimes overlook this item. Proceed, then, in full consciousness of being the object of eager scrutiny! It is your duty to the patient to take pains: it is your duty to yourself to make it perfectly clear that you are taking pains, my young professional brother! Above all things avoid haste in your examination. The malady is of deep interest to the patient, even if of little scientific interest to you. When you are known to be a busy man, patients will excuse haste; but at first haste is looked upon as indicative of lack of zeal. Proceed systematically. By so doing you will not be so liable to overlook some important matter, which may escape recognition otherwise.

Place the patient in a good light, so as to give the eye every advantage. Observe closely while putting your questions. Do not hurry the patient. Perhaps the latter is most eager to tell you something. It is usually well to let him do so. Until he has done so, his mind is disturbed and unequal to giving such answers to questions as are desirable.

If not to the point altogether, some of it probably is worth noting. The first thing to be done, after putting down the patient's name, is to inquire his age. If a lady, a little tact may be requisite to get over this matter without giving some offence. This matter of age is a cardinal fact. By it you may measure almost all you can elicit. But of this anon.

The Family History.—Patients attach much importance to the doctor 'knowing their constitution.' With a stranger all is new. How are you to learn the constitution ?

Inquire first, 'Is your father alive ?' If so, if well. If not, what does he suffer from ? If dead, of what did he die ? Ask if he had a stroke, or dropsy, or fits, or was 'asthmatic'—this covers every form of difficulty of breathing with the laity. The answer will often give you a clue to the malady or diathesis of your patient. Ask if there is any family malady. If his father's brothers and sisters are alive, or what they died of. If there is any family ailment, by this you will learn it. If the patient can tell you nothing, the probability is there is not any family ailment ; and this negative information is worth the trouble it costs.

Then proceed in the same careful manner over the mother's side.

Then it is well to ask the patient to which side he is said 'to take.' Such information is leading up to the next matter viz., the individual ; and will usually tell whether it is the nervous system, the thoracic organs, or the abdominal or pelvic viscera, which first fail.

The History of the Individual.—It is well next to proceed, 'Have you been generally healthy ? Were you a strong child ? What maladies of childhood did you have ?' Out of this, much that is useful may often be gleaned. Of course at first the youthful practitioner gleans but little. As his self-education progresses, he learns more and more by such questioning.

It is well, too, to inquire as to growth: whether the patient grew markedly by fits and starts. A long growing fit, by which a great addition to the stature was attained, commonly entails some mischief in one or other lung apex, of which distinct evidence may remain. All apex mischief is not recent, when found by the doctor!

Puberty occurs during the period of growth, and few persons escape some disorder of their health at this time. Especially is this true of women. And now, my young reader, permit me to take the position of an elder brother for a moment. For am I not your elder professional brother? A woman's privacy must be respected. As you are a man, bear that in mind. Women, too, attach even an exaggerated importance to matters involving their reproductive organs. But before a class of students it is very difficult to make the requisite inquiries. Consequently as a rule this subject is either entirely neglected, or slurred over. The student's mind is not roused on the matter, and habitual neglect of the subject becomes the rule in life; unless the practitioner is awakened to the matter by some untoward occurrence.

The time when the catamenia appeared; their amount, whether great or small; the absence or presence of leucorrhœa, in the intervals of the periods—all ought to be ascertained. Anyone who attends the clinique of Dr. John Williams, of University College, will be struck by the scrupulous care he displays on this matter; and impressed by the manner in which he shows its importance when he comes to the after-history of the patient. When a woman becomes a patient, it is impossible to omit such inquiry. 'A woman is an organism around a uterus,' a physiologist once remarked. The matter of her 'generative expenditure' previous to impregnation (as well as afterwards) is then not to be ignored; nor yet inquired after in an offensive manner.

Maturity.—Then comes the subject of adult life. The occupation, the habits, if active and sedentary, outdoors or indoors. Note any ailments the patient may have had,

whether they were readily recovered from, or otherwise. (If the patient has always recovered slowly, make your prognosis, and take your therapeutic measures accordingly.) Then learn how the evenings are spent; this is far from unimportant.

Then ask as to matrimony. If a woman, when? how many children she has had? at what intervals? did she suffer much in pregnancy, or in her confinements, or after them? If she has had any 'slips'? the conventional term for abortions, or premature confinements. A 'slip' often deteriorates the health very pronouncedly. A considerable blood-loss, or a heavy discharge after the confinement or slip, usually leaves its mark behind for a long time. Note also if the patient made a slow or rapid convalescence. Further, if she suckled all or any of her children; and if not, why?

Sometimes all this can be readily ascertained, particularly when the patient is intelligent, grasps the questions readily, and answers them quickly and accurately. But all patients are not intelligent! Sometimes the information has to be extracted by close and severe cross-examination. Some patients will admit nothing until they can catch the drift of the inquiry, and make up their minds how much they will answer. Such patients are often Scotch. Then others will answer before they have had time to fully grasp the questions. Such are often Irish. Some tell too much, others too little. Both are troublesome, and occupy much time.

Much, too, depends upon the confidence you inspire. Men will not give it to you unless you seem to deserve it. If they cannot trust your prudence, of course they withhold it. If they give you it as your examination proceeds, you may legitimately feel that you are producing a favourable impression. As to women, they not only must have faith in your prudence, but, more, they must feel they have your sympathy, else they are dumb. Modesty restrains them, or sometimes prudishness interferes; and the latter in a

woman whose conscience tells her that her conduct has not always been above suspicion, is often very provoking. No woman, too, chaste or unchaste, will answer questions put to her which do not take their origin in the fulness of knowledge. Unless you can let a woman see that you know perfectly what you are talking about, your questions are asked in vain. It is not in the nature of a woman to answer readily or truthfully idle questions on delicate matters; their *raison d'être* must be apparent. Once convince a woman that your questions have a valid foundation for them, and she will give her confidence without reserve. But you must not nip her growing confidence in the bud by want of care or sympathy, else the spring will dry up. Do not, too, make it more difficult than it might be to her to answer by any hesitation; ask after delicate matters as you do after her appetite. Encourage a woman to answer by making answering easy to her. Do not wound her womanly modesty by asking your questions coarsely or without due consideration for her feelings. If you forget these matters, your patient will not!

Establish a good understanding betwixt you and your patient. Without this the relations are overstrained, and a rupture will soon occur. Be patient. The patient may be nervous: put her at her ease by kindly courtesy. Elderly patients entering upon degenerative changes are generally stupid, because the brain is failing. Often they are doing their earnest best, and yet are stupid. Do you not suppose that they may be conscious of their waning powers, even as Samson felt his strength going from him when Delilah shaved his locks? And the feeling is trying enough without the additional pain of seeing that their enfeeblement is apparent to others. If the patient presents evidence of any taxation of the nervous system, note it, and bear with him, or her accordingly. The matter of mental phenomena, however, will be discussed further on in Chapter XI., for they often are of the greatest importance.

CHAPTER II.

EXTERNAL APPEARANCE.

WHILE this interrogatory is going on, the brain need not be solely engaged with what is reaching it through the ear; the eye should be busy taking notes.

The information so furnished is of priceless value. But the eye can only see what it carries with it the power to see! If untaught, the eye observes little; when trained, it can see a great deal. This subject has attracted the attention of some excellent observers. Prof. Laycock taught the importance of 'Physiognomical Diagnosis,' in the recognition of diatheses and cachexiæ; Marshall Hall wrote an able article on 'Symptomatology,' in the 'Cyclopædia of Practical Medicine;' Jonathan Hutchinson's remarks on teeth, especially in inherited syphilis, are well known; S. Wilks has written on 'Temperaments,' and Dr. Southey on 'Diatheses.' Prof. Gairdner contributes an excellent memoir in Finlayson's 'Clinical Manual for the Study of Medical Cases;' Prof. Austin Flint has an admirable section in his 'Clinical Medicine;' as a contribution to this subject, I have written 'Semeiology' (*Σημειον*—a sign), in the Students' Aids Series. The subject is one which will attract further attention as the importance of other matters than mere physical examination dawns more distinctly on the medical mind. The narrow if intense view of which the late Prof. J. Hughes Bennett was the most famous British exponent, still dominates the minds of young medicos who tread in the footsteps of the German School with great fidelity: alike those who have studied in Germany and Austria, and those who copy them at home.

The following remarks must not, however, be regarded as exhaustive of the subject.

General Appearance.—The eye is scanning the general appearance of the patient while the conversation proceeds. The apparent age is compared with the chronological age, and the patient is noted to be comparatively young, wearing well; or looking much older than he is. It marks whether he wears the hue of health, or the pallor of cachexia; the venous flush of taxation of the right side of the heart, is often accompanied by a certain blurring of the features. There may be obesity, or more commonly the wasting of phthisis, or other emaciating malady. The rapid or laboured respiration may tell of impairment of the thoracic space, or emphysema, the accessory muscles of the neck playing actively on each respiration. Or there may be the untied shoe and swollen feet of dropsy, or the slit shoe of gout. In other cases the waistcoat is buttoned wrongly, or askew; or the trousers left unbuttoned, and perhaps the shoe down at heel, in brain failure. At other times the gaping waistcoat or unfastened gown tell eloquently of ascites, or an ovarian tumour. When the head and shoulders are thrown backwards to maintain the balance, the abdomen is seen to be protuberant; and pregnancy may be the cause.

The general appearance will tell us, indeed, how far the patient is 'ill' from the malady—broadly, that is. Sometimes the features wear a fixed look of pain in organic disease producing persistent suffering; or there is the bowed-down look of frontal headache, seen in the bilious; or the hectic flush on the cheekbone tells its tale, 'that consumption has already hoisted its bloody flag of no surrender';* or 'carking care' may have written its signature legibly on the features. The patient may look despairing, or courageous—a matter of which it is well to make a note.

Diathesis.—The diathesis, or inherited constitution, com-

* It can sometimes be induced to haul down its flag.

monly betrays itself in the physique; and the recognition of the diathesis often tells most weightily upon the opinion formed as to the course the case will take and the measures required. Syphilis, with anything approaching proper treatment, is rarely very disturbing to a person of well-marked gouty diathesis, or other person with good bones; while it is likely to work havoc in a feeble, strumous constitution, despite all care. As these different diatheses are important, it may be well to give them, with some abbreviation, from Prof. Laycock's 'Observation and Research.' (The reader interested in this subject will find it dealt with at length in a series of lectures published by the late Dr. Laycock, in the *Medical Times and Gazette* for 1862, first half-year.)

The Gouty or Sanguine Arthritic Diathesis.—This presents the following features. A well-developed osseous system, firm muscles, an erect carriage, with a generally robust appearance; the nutrition is active, the digestion (usually) good; the respiration is deep, the heart large, the skin usually florid; the head is large, with a massive jaw, the teeth solidly enamelled, while the hair is thick and strong, not falling easily; the pulse is usually firm and steady, while the blood-pressure within the arteries is high. Such persons are liable to diseases of the vascular system. The heart becomes hypertrophied; the distended arteries undergo atheromatous change, the aortic valves become diseased, and, to a less extent, the mitral valves, while true apoplexy, aneurism, and angina pectoris belong to the full artery. As time rolls on, the hypertrophied heart undergoes a fatty necrosis of its fibrillæ, sometimes ending in sudden death, while at other times dropsy closes the scene.

A common blend is that of the gouty with the nervous diathesis, to be given a little further on.

The Strumous Diathesis.—This has an imperfectly developed osseous system as one of its characteristics. The bones are small, the shafts slender, and the epiphyses enlarged; the hand is often unshapely from this osseous defect. The

thorax is small (probably this has something to do with their liability to phthisis). The forehead is often lofty and prominent; there are either long, silken eyelashes, or, in worse cases, broken eyelashes maybe with ophthalmia tarsi; the jaw is light, with teeth crowded or carious. There is a certain fulness of the lips and *alæ nasi*, which give a piquant look to strumous 'fairy' children. The hair is often light in colour, and fine or thin. The eyebrows are arched, or very straight; often thick and well-marked in persons of dark complexion. The skin is often moist with an acid perspiration; while, in strumous children, crystals of uric acid (rhombs) are frequently to be found in the urine on standing some time. Diseases of the bones, rickets, hip-joint disease, and spinal curvature are common in childhood; or there is a large lardaceous liver, or, more commonly, enlarged mesenteric glands. The glands of the neck are liable to be enlarged as childhood merges into puberty, and consumption (pulmonary) is often then set up—the consumptive taint, indeed, commonly goes with the strumous diathesis. Defective nutrition is a marked feature in many; consequently tubercle in all its forms is found in the strumous, from the meningeal form common in childhood (acute hydrocephalus), to the pulmonary phthisis of adult life. To maintain the nutrition is the difficulty with persons of the strumous diathesis. All cachexiæ affect such persons profoundly. Red-haired, or very black, strumous individuals, when the subjects of phthisis or syphilis, suffer greatly—dying with the first and being severely handled by the latter. The ordinary hospital out-patient is commonly of this diathesis. It may be blended with the gouty, or with the nervous diathesis.

The Nervous Diathesis.—This belongs to slight beings, who are also free from fat. It seems on the increase at the present time; viz., in other words, we are moving in the direction of the nervous diathesis. The osseous framework is small, but perfectly developed. There is usually

a high forehead with a well-vaulted skull, with small well-cut features, and an active eye. The nervous system is highly developed, and these slight beings are stronger than they look. They carry little fat, and have small abdominal viscera. Active energetic beings they are; sometimes benefactors to their neighbourhood, at other times social nuisances. The small, chattering, monkey-like beings, not unfrequently seen, are the less desirable section of this folk. They rarely take alcohol, but enjoy tea. They are the leaders of popular benevolent movements. They belong, indeed, to the Arab type mentally and physically; while the gouty resemble their Norse ancestors in character and physique.

The gouty and nervous diatheses are often found blended together. Then the form of gout assumed is not so much articular as the dyspeptic, with skin affections and nervous phenomena. Indeed, the nervous diathesis carries with it a history of various neuroses. One member of the family will be the subject of neuralgia, another have epilepsy, while a third is a dipsomaniac.

The Bilious Diathesis.—This comprises the dark swarthy beings of our social fabric. They are stained with bile, and liable to biliary disturbances. When the bilious and gouty diatheses are blended, then the resultant product is a large person, fairly active, and a steady worker. The bilious and nervous blend furnishes a small active being. Such is the typically bilious lady—active when fairly well, but a great sufferer. On the other hand, when the bilious is commingled with the lymphatic diathesis, a comparatively helpless creature is the result.

The Lymphatic Diathesis.—This is the antithesis of the nervous diathesis. Large, listless, lazy persons belong to this class; mostly always below par, requiring whipping up with good food and alcohol. The bony framework is large, but the muscles are small and soft. They are usually of pale complexion. Such persons bear depressants badly.

They are never well in relaxing areas. Women of this type are prone to heavy catamenial losses with leucorrhœa; and are liable to flood profusely in parturition.

When the eye has learned to distinguish the features of a diathesis with its blends, it can often gather valuable indications therefrom. For the diathesis modifies disease often; gives it certain characters, valuable for prognosis and treatment,—the outcome of full complete diagnosis. But in many instances no distinct diathesis is discernible, the blending is so complete.

The following observations of Sir James Paget's apply largely to the matter of diathesis. He, in speaking of blended diseases, says: 'We should look out for indications of the existence in the same person of two or more morbid conditions or dispositions such as may be derived from both parents or several ancestors. For, as in plants and animals there are hybrids and mongrels, or as in chemistry many compounds and mixtures, so are there in diseases. We see them in the multifarious and confused varieties of what we have to call rheumatic gout; in gout crossed with scrofula, and syphilis crossed or mingled with scrofula or gout. It is often not difficult to discern some of these combinations among our cases; and I know few things in practice more useful than to be able, even in some instances, to adjust our treatment to the proportion of each disease in the compound. But we may be sure that there is much more to be learned in this direction; and it is best to believe that we rarely have to do with a simple and unmixed morbid constitution. There are few worse habits in practice than that of commonly saying of one case, "It is all gout;" and of another "It is all scrofula," or "all syphilis." We might as well say of any Englishman that he is all Norman, or all Anglo-Saxon, or all Celt. We may, indeed, sometimes see persons who appear to be as types of races unchanged in many centuries, but in practice we had better study every man as, for better or worse, a composite of many ancestors.'

This is a pregnant passage well worth thinking over again and again. Sir James admits that the Norman, the Anglo-Saxon, and the Celt have their characteristics, which can be recognised in the blend. So of diathesis: usually it is possible to discern the leading characteristic; while in many cases the type is not pronounced. Of course, where no distinct diathesis is present, this scrutiny gives negative results; but when such is present, the power to detect it is a valuable possession.

Cachexia.—While the term ‘diathesis’ is used to signify the inherited constitution, ‘cachexia’ is employed to denote an acquired condition. Thus the leading cachexiæ are those of syphilis, cancer, malarial poisoning, mercurial or other poisoning, and gout. In all, except plethoric gout, there is the pallor of anæmia; for these poisons strike at the construction of red blood-corpuscles. When a cachexia is detected, the diagnosis usually carries with it the successful treatment, except in cancer. The cachexia here may help to clear the diagnosis of cancer, but it abolishes the last ray of hope even of successful removal; for it tells that the cancer is not local, but in the system, and that it cannot be eradicated.

A cachexia may be implanted upon a diathesis, like a spire upon a tower as seen in some church-steeple. Thus a person of strumous diathesis may acquire syphilis or gout, or a gouty person may be the subject of lead-poisoning; and as Garrod and others have pointed out, gouty persons are exceedingly susceptible to lead, often suffering from an amount of lead which has no ill effects upon other persons (the non-gouty). A person of the nervous diathesis may be also the subject of malarial poisoning; and then the remarks of Sir James Paget, just given, apply closely. In an anæmia linked with a cachexia, the specific remedy for the poison must be added to chalybeates for blood-formation or red corpuscle-building to go on.

These observations are of treble value in the numerous

cases where there are no particular physical signs to observe, where the young practitioner is apt to find himself utterly baffled, and left helpless by his medical training as at present conducted. Malarial or paludal poisoning has no physical signs; indeed, furnishes nothing to the test-tube or the microscope—at least in life, and only doubtful evidences after death. But it may write legibly on the tegument its name and lineage: not always, however, in such bold characters that he that runs may read; sometimes in such small print that it requires a keen scrutiny to decipher it.

Yet the pallor of one cachexia differs from that of another. There is the pallor of simple anæmia from loss of blood, or other drain; which is without a cachectic shade. In gastric ulcer, however, there is often perceptible cachexia. In the large white kidney there is usually a cachectic pallor which the eye learns to recognise—if language be not sufficiently precise to describe it. Sometimes the skin has a hue as of discoloured parchment, which I have observed in some cases of visceral cirrhosis, and in some young men with syphilis. In chlorosis the anæmia has a greenish tint. Then there is a waxy pallor in profound anæmia, especially in pernicious anæmia. Or there may be a colour added, as in the yellow hue of cancer and the bronzing of Addison's disease. There is the hue of the gipsy, which has been mistaken for Addison's disease. While at other times the skin looks muddy and opaque, as in some cases of syphilis, and in other cases of grave organic disease. The mitral flush is often marked; while the deeply injected face of some cases of distension of the right side of the heart is itself sufficient to establish the nature of the case. The 'blue man' whose tissues are stained by a long course of nitrate of silver, usually taken for epilepsy, is now only occasionally seen.

Expressions.—Beyond the hue, there are matters connected with the muscles of expression which are worth noting. The face of cholera is ashen in hue, the skin livid, the eye sunken, for the water of the tissues is being drained

away. The Hippocratic face of death is pale, of a leaden hue, with sunken eyes, the eyelids often separated, the cornea losing its transparency and the eye its expression; the nose is pinched, the temple is hollow, and lower jaw drops. This is the face of the dying, and when well marked tells that no recovery is possible. In the typhoid state—whether from a long high temperature melting down the tissues, or from a more truly uræmic condition—the face is dull, vacant, and without expression, while the teeth and lips are covered with sordes; when advanced, the mouth is open and the tongue is seen like a brown, fissured ball; while the patient lies flat on his back in bed, slipping away from the pillow towards the foot of the bed. Whenever a patient who has been flat on his back moves over to one or other side, this is of good omen. In pyæmia, the expression is lost in a look of dull indifference. Then there is the anxious look of real illness, which often is most valuable in helping the observer to read aright the meaning in some very complex cases where it is impossible to say whether the case is a serious one or not, without such aid. On the other hand, the natural expression of the face may whisper hope even when the case presents some very dark phenomena. It is in their subtle, incommunicable power to read the facial indications that some practitioners excel so in prognosis: they can give no explanation beyond ‘You can see it in the face;’ but what that ‘it’ is, they cannot tell. Nevertheless they can both see it and read its interpretation. The face of true organic disease entailing much suffering is eloquent in many cases. There is a pallor blended with a look of pain, as seen in abdominal aneurism eroding the spinal column, or intervertebral cancer. It is also seen in recurrent paroxysms of angina pectoris; and is often pronounced in cases of persistent, racking headache of organic origin. Sometimes this bowed-down look of pain is seen in women who are markedly ‘bilious.’

In some acute conditions the expression is very suggestive.

The reader knows this who has watched the oncome of a labour-pain in a parturient woman. It is a certain twitch of the lips with that contraction of the eyebrows which produces a frown. In the second stage of labour, this peculiar look passes into one of determination as the patient puts forth expulsive efforts. Once seen, this twitch of abdominal pain is ever after readily recognisable. In many affections below the diaphragm involving recurrent paroxysms of acute pain, this twitch can be seen fitting over the face. In peritonitis the upper lip is raised so as to expose the front of the teeth in a manner which is quite unique.

In the face of hectic fever there is the wasting of the tissues which throws the cheek-bones up in strong relief, with a red spot over each of them which tells usually of softening tubercle. In cases of extensive lung-disease of the phthisical variety, the nostrils often quiver in a very significant manner.

The Hue of the Skin.—Pallor is the product of anæmia; either the transient blanching of fear where the facial vessels contract, or the more persistent state of insufficiency of arterial blood. It belongs to the cachexiæ as described above. Then it may be linked with œdema. This is well seen in acute nephritis, and in some cases of large white kidney. In the last there is often an unusual smoothness of the skin, like a bladder of lard. In many cases the skin is also dry and unspirable, and seamed with wrinkles in old persons. In some phthisical patients there is pallor with an unctuous skin, and such accompaniment, in my experience, is of bad omen. In certain cases of aortic disease in comparatively young persons, the skin seems to undergo a species of fatty degeneration, being greasy and opaque.

In plethora the hue of the skin is deepened. It is not the rosy red of sundry high-complexioned persons where the epidermis is thin and the crimson blood

shows clearly; it is the injected hue of vascular fulness, what used to be thought, and not inaccurately, to indicate apoplexy.

It is the high colour of old Father Christmas, and often tells of good living. Or it may be due to exposure; and the deep colour of the face of well-nourished engine-drivers is worth noting.

It differs from venous fulness, which is darker, just as venous is darker than arterial blood. It is the dusky hue often seen where the respiration is embarrassed. Here the lips are of purple hue, resembling the lips in the cyanosis of congenital heart-imperfection. Sometimes deep-coloured crimson dendritic twigs of vessels are seen at the alæ of the nose on a complexion of dusky pallor, telling of atheroma. Cyanosis in infants and young persons tells of reptilian hearts; and such beings rarely survive the period of puberty, while they never undergo pubertal changes. A peculiar blueness is seen mostly on the tip of the nose, the lips and cheek-bones, and in the hands, in some persons who take chloral. It is a hue *sui generis*, in my experience at once unique and pathognomonic. The hue of venous fulness is worth learning, as it often furnishes most useful indications. As a transient condition it is often suggestive of the patient's condition. When seen with some blurring of the outlines of the face in cases of want of tone, it tells the patient is not so well; and enables the shrewd and observant practitioner to say to the patient confidently, 'You are not so well to-day!' Or its absence prompts the opposite remark, 'Ah, you are feeling better to-day!' (Both of which matters are worth the noting; for by the remark made the patient recognises that the doctor knows what he is about, or the opposite.) Such injection, with blurring, is common with women about the change of life; and is almost certainly present, more or less frequently, in those cases where the patient is subject to 'flushes,' that is, rushes of arterial blood to the head and neck. It shows a low

arterial tension with a certain amount of vaso-motor paresis, to use an expression in vogue at present.

A flushing of one cheek is common in pneumonia; usually the cheek of the affected side. The establishment of such a flush is significant of phthisis in chronic pulmonary disease.

Then there is the red tip of the nose of dyspeptic females with constipation; which, as a chronic condition, contrasts with the transient flush across the nose, extending halfway over the cheeks, significant of acute indigestion in other ladies.

All these associated facial conditions are worth the time it takes to study them. The information so furnished to the eye will often guide the inquiries and inspire the remarks so as to win, and deservedly too, the confidence of the patient and the patient's friends. These last are always impressed by remarks and questions which tell of the doctor's familiarity with the patient's malady: a matter which invites their confidence, and not in vain.

Then there are items in different portions of the visible body which also are well worth the noting. To proceed from above downwards, the first matter is:

The Hair.—Strong coarse hair does not fall early, said Professor Laycock; all such hair, he holds, belongs to the gouty diathesis. Certain it is that such hair, going grey early, is found in comparatively young persons of robust physique and belonging to gouty families. It remains in advanced life white as driven snow. Good hair in abundance is usually indicative of a sound constitution; though it must be admitted that some undoubtedly strumous individuals, men as well as girls, have magnificent heads of hair.

Hair turns grey in two ways: either on the temples first, spreading from thence gradually; or uniformly. Sometimes the greyness is rapid, indicating some great trouble; or even sudden, in intense emotion. At other times an isolated white hair is seen here and there amidst dark or raven-black locks. This is like the solitary snow-flake

borne on a northern blast which precedes the coming snow-storm! it, too, tells of coming whiteness.

Some observations made in the dead-house of the great hospital of Vienna told that such isolated white hairs in otherwise dark hair, are in some way associated with kidney-changes, for such change was usually found therewith; though these were not necessarily so advanced as to be a factor in the production of death.

The condition of the hair will often give useful information. Sudden greyness will tell of trouble; or if at the temple only, maybe of severe facial neuralgia. When the hair is seen to turn much darker again, then it tells the trial has been passed. When the hair is glossy and bright, it tells of good assimilation and nutrition. In cases of phthisis, where fat is not taken well, the hair commonly loses its lustre, becoming dry and brittle. If the case takes a turn for the better, the hair will recover its natural appearance as a return to health is achieved. This may be so marked in some cases, that if not seen for a considerable interval the hair will itself tell of the great improvement that has taken place. In certain morbid conditions the hair has a great tendency to split at the ends. A good story is told about the late Professor Laycock, that from observing the split ends of the hair in one case he was able to diagnose aortic valvulitis. The absolute truthfulness of this story, however, cannot be guaranteed; but it is not impossible that this took place, as Professor Laycock certainly did make observations quite as wonderful.

Good strong hair, like good teeth, is usually found with a good constitution; the exceptions, as said before, being found in certain strumous persons.

The Forehead.—The formation of the forehead is at times indicative of the individual. When high and well-vaulted it tells of the nervous diathesis. Commonly this goes with the thin flank, the Arab type; and then the individual has Arab proclivities, likes tea or coffee, and is fond of the sex.

While the broad, low brow goes with the broad square abdomen and large digestive organs: this gives the old Norse type, good eaters and drinkers, with a heaven consisting of a drinking-hall, as contrasting with the Arab harem. These latter take alcohol kindly, and care little for tea or coffee; but they drink in moderation—for them, for they usually can drink considerable quantities with impunity. They may degenerate into sots, but the true neurosal dipsomaniac belongs to the first class usually. To observe these types when manifested, commonly gives a clue both to their maladies and their management in each class.

Then the forehead may be protuberant, and such is often seen with the earthy complexion and sunken nose of congenital syphilis in strumous families. The rachitic child has also a protuberant forehead, with the centres of the bones well ossified, but with gaping fontanelles. 'The head of the child in rickets is generally unusually large, the vertex flattened, and the forehead prominent, broad, and square, with considerable expansion on the centres of the parietal bones.' Sometimes the sutures remain unclosed, as in chronic hydrocephalus; or become closed too early and firmly, as in the cretin and the idiot, where the intellect remains childish—a child's brain being locked up in the osseous case. A small skull, however, is not essential to imbecility. The arrested development of the facial bones may make the protuberant forehead even more conspicuous. The forehead may carry with it a moral significance, and the broad eburnated forehead was that of which Jeremiah said, 'Thou hadst a whore's forehead, thou refusedst to be ashamed'—a matter at times worth noting. Then there may be a rash around the edge of the hair, which may be measles, or may be the coronal rash of syphilis. Or a solitary copper-coloured spot may tell its eloquent tale. Ulceration of the forehead, especially when serpiginous, either as an ulcer or as a scar, is pathognomonic of syphilis; care being taken to ascertain that it is not the result of an injury.

The Eyebrow.—The eyebrows are often either very arched or abnormally straight in some strumous persons. They are, too, unusually thick or even bushy in some cases; and persons with such thick arched or straight eyebrows are bad subjects for phthisis. Then severe prolonged or repeated facial neuralgia may lead to increased growth of the eyebrow at the outer extremity, with a deeply pigmented patch of skin around it. A perpetual frown indicates either mental depression or persistent suffering, commonly abdominal.

The Eyelashes.—In persons of robust constitution these are usually short and firm. In strumous children they are commonly long, full, and silken, giving a pleasing expression to the eye. Indeed, the long eyelash goes with the full lip and *alæ nasi* of struma, which may unite to give a very piquant expression. At other times there is an opposite condition, the eyelashes being broken and stumpy, with suppuration around their roots, and the expression is repulsive, there being *ophthalmia tarsi*, sometimes with *ectropion* or *entropion*.

The Eyelids.—Beyond nervous indications (to be given further on) the inner aspect of the eyelids will commonly tell correctly of the presence or absence, and the amount, of *anæmia* present in a case, and are often scrutinized for that end. At times, however, the eyelid can tell something very significant. Thus, in certain individuals, the lower eyelid is swollen or 'puffed' on rising in the morning. This may occur with elderly persons, even of high complexion, but is most common with pallid, middle-aged ladies; it indicates Bright's disease, with the large white kidney. At other times the eyelids, indeed the orbit generally, are the seat of distinct pigmentation; this may either occur as a transient affair at the catamenial periods, or be present more persistently in the discolourations produced by pregnancy. Some individuals are very liable to these pigmentations, which recur in them again and again. A quiver of the *fibrillæ* of the eyelids will at times tell of nervous trouble, alcoholism for instance.

The Eye.—This can furnish much information if read aright. The eye is oblique in many cretins and imbeciles, who may present the Mongolian type of feature in other respects. In exophthalmic goitre the eye is unduly prominent; and the prominence may be slight, so as to give a look of interest to the case, or so pronounced as to be very unsightly. It varies in amount from time to time. Then the conjunctivæ may be stained with bile when the jaundice is so slight as not to be discernible in the skin; or it may be injected in the chronic alcoholic, with the large vessels, quite tortuous or serpentine; or a choroidal flush may show itself. In some cases of Bright's disease the conjunctiva is pearly-white, or blue-white. In the 'Bright eye' there is a drop of fluid behind the conjunctiva, which looks like a tear; only it can be moved about, which is not the case with a tear. The cornea may be ulcerated in conditions of malnutrition, or bear the scar of by-past ulceration; or it may be opaque from keratitis, the result of inherited syphilis, which does not show itself in this form until after puberty. The opaque cornea, the sunken bridge of the nose, and the pegged teeth, when found together, constitute a unique and pathognomonic physiognomy; but it is well to know each detail of the whole, so as to be able to appraise it when found alone.

Then there is the well-known arcus senilis. Now *arcus* means a bow, or an arch, and is not a ring (*annulus*); consequently it is 'the senile arch,' not 'the senile ring.' It is found first as a rainbow under the upper eyelid; then a like arcus forms under the lower eyelid; ultimately the two join, and then a ring is formed. Such is the arcus senilis, of which much has been written vaguely. It must be borne in mind, too, that there is a 'true' and a 'false' arcus; the first being full of significance, while the latter is of no consequence, diagnostically or otherwise. The latter is the more palpable, however; it consists of a ring of fine calcareous deposit at the union of the cornea and the sclerotic,

where there is a ring of bony plates in certain birds; when the surgeon's knife passes this ring, a slight sense of grating is experienced. The 'false' arcus is often seen very marked in people with light-blue eyes, and this white ring gives a bird-like expression to the eye. Its outlines are distinct and clear, while the cornea is perfectly transparent within the ring. The 'true' arcus consists of two segments, which approach each other and unite in time. It is a development of fat-granules, and is the outward visible sign of tissue-degeneracy. This arcus has badly defined edges, especially on the inner surface; while the cornea is hazy and cloudy from a development of fat-granules throughout its structure—the expression of the eye is largely lost in many cases in consequence thereof. Such, then, are the 'true' and 'false' arcus, and it is well to discriminate the two in practice. The 'true' form is significant; the 'false' is usually seen in persons free from any degenerative changes. In estimating the probability of fatty degeneration in a heart clearly wanting in vigour, the true arcus, taken along with evidences of atheromatous changes in the arterial walls, is often of great value.

Then as to the pupils. They may be dilated, and often are so, in anæmia; on the other hand they may be contracted, as in opium-poisoning, or even from indulgence in lozenges containing opium or morphia. Marked difference of size in the pupils, one being decidedly contracted, is suggestive of aneurysm. The pupils are of varying size in several conditions, which will be discussed in a succeeding chapter. The immobility of the pupil to light is often of considerable diagnostic value; as to the size of the pupil as a guide in the administration of belladonna, it is simply nonsense. For years I have given belladonna very freely, and it is the exception, and the rare exception too, to find the pupil affected. Besides, what of it when it does occur? It is too meteoric to be of any value when found. The man who would stop the administration of belladonna

merely because the pupil is dilated, is as unreflective as the man who would not stop it because the pupil was not altered, though there might be other and valid reasons for suspending its administration. (Even when there is dryness of the throat and dimness of vision, or even difficulty in emptying the bladder, it is by no means necessary to stop the belladonna if it is doing good, as in arresting the night-sweats of phthisis; where it is invaluable if boldly but judiciously used.)

Then the iris may tell its tale. The red iris suggests syphilis, the common cause of iritis. Or a tubercle may be seen protruding into the pupil; or a scar may tell where inflammation once has been; or the size and shape of the pupil may be altered.

The eye is also an organ of expression, and as such may be studied with advantage. The gaze will often tell of a resolute disposition, or of wavering courage. An unsteady gaze tells that the individual cannot be relied upon, either from want of courage, or want of purpose, or inherent deceptiveness. The secret drinker rarely has a steady eye. The liar may have it, however. Usually much depends upon the eye of the observer, and, if steady enough, the other will usually quail. It is well always to watch the eye, when doubts are entertained as to the veracity of a person, during both the questions and the answers. The eye is often more truthful than the tongue. In all relations of life, the question of mastery—in other words, the settlement of ‘the will-fight’—frequently crops up, and the eye is the organ with which the matter is decided. Two people look each other in the eye, and they recognise each other’s position ever after. When in doubt as to whether a patient is going to adopt the advice given, or spurn it, it is well to catch the eye, and the decision is soon known.

In conditions of insanity, the gaze has a recognised value. There is the downcast eye of melancholia, the vacant stare of dementia, the glare of suspicion and distrust, the excited

look of mania, or the elated air of the general paralytic with his unequal pupils. By study of the expression of the eye, you may learn whether you have an obedient or mutinous patient to deal with : a piece of diagnosis far from valueless in prognosis and treatment.

The Nose.—Perhaps some anatomical details are scarcely to be classed under ‘the physiological factor in diagnosis,’ but the features cannot be included under ‘the physical signs.’ They belong to the individual rather than any particular morbid condition, and can still less have a division of their own ; so, to prevent their entire omission, they may not unfitly be considered here.

There is the play and quiver of the nostrils in thoracic disease, or in nervous excitement, undistinguishable almost except by other accompanying phenomena. Then the sunken bridge tells of the ‘snuffles’ of infancy in the inheritor of syphilis, where the chronic inflammation has bound down the nasal bones, and arrested their growth. In struma the *alæ nasi* are full and tumid, as is the upper lip. There is the red tuberous or bulbous nose of the drinker, a condition sometimes closely simulated by disease. Then there is the red tip of females with indigestion and constipation, with or without pelvic complications. Or the nose may be abnormally pale. Cold feet go with both conditions, and the indications so given point to the appropriate treatment.

The Lips.—The full lip of struma has been spoken of before. When not too pronounced, the strumous face is an attractive one ; but when very marked, the thick lip and coarse nose, often with swellings of the glands of the neck, brutalize the face. The lips are often blue or purple, as in the cyanosis of congenital heart-imperfection ; or in venous fulness from cardiac valvulitis, or other thoracic disease in which the right heart is embarrassed. A temporary fulness and coarseness of the lips often follows excessive sexual indulgence. The full under lip tells of a sensual disposition, a hint pregnant with information at times. Scars at the

angles of the mouth almost invariably tell of inherited syphilis. An herpetic rash on the lips is commonly accompanied by a certain amount of pneumonia; and when found with a cold, it is well to examine for the other. Sordes on the lips belongs to the typhoid condition, to be considered later on.

The Gums.—These furnish little information, but when they do, it is well worth attention. Thus in lead-poisoning there is a blue line along the edge of the teeth, which when seen is pathognomonic. Then there may be ulceration along the line of the gums and the teeth, indicating a cachectic condition. At times the gums are foetid and spongy, as in mercurial salivation, not often seen now. Or they may present a spongy state with blood oozing from them, as in purpura, or scurvy. They are morbidly pallid in anæmia.

The Teeth.—Much may be gleaned from observation of the teeth. First, however, be certain that the teeth are natural products; the dentist copies the natural teeth now so carefully, that it is not always easy to determine their nature. Well-shaped teeth, badly-formed teeth, white teeth, yellow teeth, any kind of teeth can be matched by the dentist now! The teeth may tell of excessive indulgence in tobacco, or of mere uncleanness in the individual. Or they may be stained by chalybeates. Or there may be caries, telling its own tale. This may be inherited delicacy, the structure of the tooth being defective, so that it readily yields to the causes of caries; or that these are favoured by the practices of the individual, as excessive indulgence in sweets with the acid formed therefrom. The teeth may look well, but the molars may be largely decayed; and herein lies much indigestion from imperfectly masticated food. Strumous persons are specially liable to caries, and their teeth commonly present a bluish line around the carious spot, or edge. Then the teeth may be injured by mercury, when they look 'dirty' rather than blue around the decaying portion. Gouty teeth are solid and heavily enamelled,

although not always large. Sometimes the two upper front teeth are very large in the gouty diathesis. The large massive well-formed teeth of some gouty persons are very useful at times in helping to aid the diagnosis of suppressed gout. The gouty are liable to lose their teeth without any caries; the tooth comes out perfectly sound from periostitis, which gradually thrusts it out of its socket.

The teeth of inherited syphilis have been specially studied by that excellent observer, Jonathan Hutchinson, who has arrived at the following conclusions: 'It is very common to find all the incisor teeth dwarfed and malformed. These teeth are narrow and rounded, and peg-like; their edges are jagged and notched. Owing to their smallness, their sides do not touch, and interspaces are left. It is, however, the upper central incisors which are the most reliable for purposes of diagnosis. When the other teeth are affected, these very rarely escape, and very often they are malformed when all the others are of fairly good shape. The characteristic malformation of the upper central incisors consists in a dwarfing of the tooth, which is usually both narrow and short, and in the atrophy of its middle lobe. This atrophy leaves a single broad notch (vertical) in the edge of the tooth; and sometimes from this notch a shallow furrow passes upwards on both anterior and posterior surfaces nearly to the gum.' Mr. Hutchinson is careful not to push this matter of the teeth further than it can go legitimately, so that in most cases the teeth can raise the suspicion only rather than decide the question of syphilis. Sometimes in undoubted syphilis (congenital) the teeth escape; but there may be fissures at the angle of the mouth, which tell unmistakably.

The permanent teeth only present these tell-tale characteristics; the first set are liable to decay, but present no peculiarity in shape. Nor must 'craggy teeth,' with their horizontal furrows, be confounded with what are now known as 'Hutchinson's teeth,' with vertical furrows. Many chil-

dren of delicate constitution have teeth notched vertically, with the absence of the fourth denticle. When there is a small jaw in which the teeth are crowded, these variations in development are commonly present. So that it will not be prudent to rush to a conclusion from the teeth alone. Syphilis is an 'imitator,' as Mr. Hutchinson teaches, and mimics conditions set up by other morbid states. Perhaps, too, it may grave deeper at times the mark due to something else originally. Naturally, ill-developed teeth are more likely *à priori* to manifest the evidence of syphilis than are well-developed teeth.

The Chin.—The chin is often indicative of the diathesis. A broad square jaw goes with the gouty diathesis; while a light slender jaw is linked with the nervous, or the strumous diathesis.

The Ears.—The ear may exhibit otoliths, the evidence of gout. Or it may have a lobe full, red, glistening, as if about to burst, like a ripe fig; such a lobe tells of the full-fed gouty person at middle age. As time goes on the tenseness is diminished, and the lobe, though fleshy, is wrinkled. In others again the lobe is seamed with wrinkles, just as is the skin of the face. In such cases there is a spare organism with a tendency to visceral cirrhosis. Or the ear may be deformed. This may be due to some violence to it; it may be the œthematoma of the general paralysis of the insane. A discharge from the ear should always put the medical man upon his guard as to the possible extension of the mischief to the meninges of the brain; a not uncommon consequence, almost always fatal.

The Neck.—The neck may present the enlarged glands of scrofula, or the scars of by-past suppuration in the glandulæ concatenatæ. The glands may be enlarged—the 'wax-kernels,' as they are termed in the north—from some condition of the mucous lining of the throat; like the sympathetic bubo of gonorrhœa. Or a large gland may remain after scarlatina or measles, or be due to disease of

the cervical vertebræ. Or the thyroid gland may be enlarged. This may be due to a local varicosity of the thyroid vessels. More commonly it is part of Graves' disease, exophthalmic goitre. Here the eyes are prominent, and the heart has an excited action. The eyes are less prominent at times than usual, or more so; and so is the goitre. Under what circumstances these changes occur are not yet known. Then the thyroid gland is found enlarged in certain localities in England, 'the Derbyshire neck;' it has been asserted that this change is found mainly in limestone districts. It has been known to be linked with the water of certain wells; those not drinking the water of a particular well escaping, while their neighbours who drank of it suffered. It is without significance, so far as is known. Sometimes the gland is enlarged generally, at other times the enlargement is unilateral. Or there may be 'wry neck,' due to cold or rheumatism; or perhaps a neurosal affection, or it may be due to a burn. Or there may be a 'stiff neck,' telling of an abscess, or ankylosis, or muscular stiffness.

The muscles of the neck are often charged with significance. In confirmed emphysema the sternal muscles stand out like cords in the inspiratory act; drawing up the immovable thoracic walls while the diaphragm descends. In dyspnoea the action is violent in these accessory muscles of the respiration. The bloodvessels of the neck, too, often speak eloquently. In aortic regurgitation with enlargement of the aorta and its branches, the pulsations of the huge heart are readily seen in the vessels at the root of the neck. Or the pulsation of an aneurysm is detected, sometimes on both sides; or maybe of an abscess lying over the carotid artery. At other times it is the veins that are full, and pulsate from a current of blood being driven backwards through an insufficient tricuspid valve, on the systole of the right ventricle. This may be temporary or permanent. Or at times it may be found without actual tricuspid incompetency.

The Thorax.—The shape of the thorax is not without interest. There may be the hump-back, telling of by-past spinal caries, leaving the individual liable to early failure of the heart, with dropsy and the other outcomes thereof. The barrel-shaped chest of typical emphysema is very instructive. When seen with the cord-like muscles of the neck, the injected countenance, the protuberant abdomen, the diagnosis of chronic bronchitis with emphysema is made; physical examination only corroborates it. Then there is the flat, narrow chest of the typically phthisical. Such chest, however, is not incompatible with emphysema. Then there are the pointed wing-like shoulders of the chronic asthmatic. When these are seen in a comparatively young subject, while the back projects, the prospect of the case is very bad. The shoulders are dragged forward by the action of the pectoral muscles, in their function as accessory muscles of respiration. The importance of the shoulders being thrown backwards, like a soldier's, is seen whenever the respiration is tested by an acute malady. Some other matters connected with the character and rapidity of the respiration will be discussed further on (Chapter IV.)

The Abdomen.—This may be flat in emaciated conditions; but more commonly it is fuller rather than flatter than normal. Thus it is enlarged in ascites, in ovarian disease, uterine fibroids, or pregnancy. It is also enlarged in 'pot-belly' (tabes mesentericus), and in amyloid disease of the liver in children. Often, however, these are simulated by a tense tympanitis. In old persons it may be due to cancer. In other cases the abdomen is protuberant from a pad of fat over it. When this is conspicuous without corpulency elsewhere, it is suggestive of free living; and when seen in comparatively young subjects, carries with it a bad look-out as to length of days. In confirmed dyspeptics the abdomen is often flat; indeed usually so, except when there is much flatulence present. Sometimes the respiration will be distinctly abdominal, telling of thoracic embarrassment.

The Hand.—This should always be observed, as it has often a good deal to tell. A large knuckle may tell of gout; or more than one joint may be affected.

The thumb is rarely implicated except at its carpal articulation. But the forefinger is the common seat of gout, either at the terminal joint or the knuckle, or there may be gouty concretions in the sheaths of the tendons. The middle finger shares in the deformity very often, but scarcely to the same extent. In some cases the hand has enlargements in every finger. In other cases a finger is drawn down by gouty inflammation in the sheath of its flexor tendon. The patient will tell you that it is due to his walking-stick, or umbrella, if in the right hand; or if in his left, that it is from the blows of his geologic hammer, or other cause of local injury. But on examining his other hand, it will be found there too to a less extent. Sir James Paget holds such pathological condition to be due to gout; indeed is pathognomonic thereof. In rheumatic gout there is also thickening of the knuckles, while the fingers are bent away from the thumb. In rheumatic gout the subjects are usually young, often women; while in gout the reverse is the case. The hand may be deformed from rheumatism due to exposure; or the knuckles may be larger from repeated violence, suggestive of fisticuffs. At other times the knuckles are prominent from wasting of the interossei muscles throwing up the epiphyses in strong relief.

Then the epiphyses are actually large in persons of the strumous diathesis. This is well seen in the hand of Dr. Johnson, of dictionary fame; and his hand and face are well worthy of study whenever the opportunity occurs, for they are well marked. In girls the joints may be seen large, with very slender shafts to the finger-bones. The large joints obstruct the getting off and on of rings. Such hand is often very useful diagnostically. It is seen in rickety children, as part of the general condition of fulness of the epiphyses; often well seen in 'the rachitic garland,' the little

festoon of prominences where the ribs give off the costal cartilages.

Then there are the 'clubbed fingers' of valvular disease, congenital heart deficiency, and also of chronic phthisis. These are seen, indeed, whenever embarrassment of the pulmonary circulation leads to venous fulness; and I have seen it very marked in early emphysema. It is said that there is incurvature of the nails in phthisical clubbed fingers.

In cyanotic states, the clubbed ends are often very blue or purple. Sometimes the nails are livid when there is want of tone in the vascular system. Here the hands sometimes 'die,' and become white and cold like the hand of a corpse. Here there is vaso-motor spasm. Such condition is common in the gouty, or the subjects of granular kidney. In others the veins are full and prominent. This may be due to contracted arteries. A transparent hand with conspicuous blue veins tells of debility.

The hand is often damp and clammy; and this 'wet' hand is held in the United States to indicate nervous exhaustion in which the reproductive system has played a part. This damp hand, which sweats the colour out of their gloves at the palm, is often found with girls where there is a large generative expenditure, with leucorrhœa usually. This wet hand, with distinct hair on the upper lip, is held by Dr. Greenhalgh to be associated with secret practices; and certainly sodden fingers with black 'hang-nails' tell distinctly of what their owners would little like to be known. In feeling the pulse the fingers (ring and little) often make an observation of cold dampness not readily revealed to the eye.

The hand will often tell of toil or idleness, and so give a clue to the patient's habits, not without value in some cases.

When there is a suspicion of jaundice, it is well to stretch the skin over the back of the hand, when the yellow tinge is often seen quite unmistakably.

The hand may tell of paralysis, and the late rigidity which follows. Or the skin may glisten, telling of nerve-injuries. The fingers are closed in some cases of hysteria; or there is a wave-like motion in athetosis. The irregular movements of chorea, either unilateral or bilateral, are well-known. Rhythmic movements of the hands are common with imbecile children. In some idiots, Dr. Langdon Down has pointed out, there is a 'woolly hand;' the skin being quite too large for the framework of the hand.

Some further changes in the hand will be referred to in Chapter X.

The Nails.—The nails are often pregnant with suggestion. But the eye must be familiar with nails, in order to distinguish correctly betwixt a naturally indifferent nail, and a good nail modified by some morbid agency affecting it. Nails consist of agglutinated hairs. In defective nails, this is usually readily seen. In gouty individuals with well-shaped nails the same is seen, so that this striation of the nail has at times a high practical value. In my own case, each touch of gout will leave its impress on several nails, and the position of the mark it leaves tells of its date until it is effaced by the growth of the nail. This gouty nail is usually attended by some brittleness, which prevents its being kept neatly trimmed. Scudamore noted in the gouty 'a remarkable state of hardness in the nails of the toes and fingers; they had an extraordinary brittleness; were frangible and scarcely capable of being cut.' The nails often bear the traces of a by-past illness, and so suggest a question sometimes not unimportant. Dr. B. W. Richardson thinks psoriasis of the nails associated with a dartsy diathesis. In this, Mr. Jonathan Hutchinson agrees with him. Mr. Hutchinson thinks that the white patches on nails, known as 'flowers' or 'lies,' are 'often seen in the nails of children and delicate persons who are in the habit of picking the nail at the root, and thus injuring its soft structures.' It

takes about seven months for a nail to grow out any such mark or patch.

The Feet.—While scrutinizing the hand, it is well to cast the eye over the feet. These may exhibit nodosities, which may tell of bunions or of chronic gout. When there is a recent slit in the shoe, probably there is present an acute attack of gout; or the foot has been subject to an injury. Or the feet may be misshapen by rheumatic gout, the great toe being folded in under the other toes.

Then the unlaced shoe may tell of œdema; or in milder cases the stocking and swollen ankle may project over the top of the laced boot or shoe. The unlaced shoe, with the waistcoat and the band of the trousers tied with string, because the buttons cannot be approximated to the button-holes, tells unmistakably of dropsy. Or the patient may suffer from corns.

The Gait.—This is worth noting. The patient may have a high-heeled shoe, telling of osseous trouble in the past; or he may have a cork leg; or he may limp from a sprain, or a tight boot, or maybe a leg-bone badly set after being broken; or he may be knock-kneed; or the tibia may be curved from early rickets. In rheumatic gout of the hip-joint the affected leg is swung round in walking, rather than lifted up; and the same occurs when the knee is ankylosed. This is obvious; if the leg cannot be lifted it must be advanced by swinging it round. In children with morbus coxarius the pelvis is tilted up upon the diseased side in order to swing round the leg. 'In the early stage the limb is usually straight, carried slightly forward, or perhaps somewhat abducted, owing to the irritation and contraction of the capsular muscles on the anterior and outer aspects of the joint. As the disease advances the limb becomes adducted, so that the knee is carried against the lower part of the sound thigh.'—(Erichsen.)

The gait may be modified by intoxication, acute or chronic.

The gait of the various nervous affections will be given further on (Chapter X.)

The Clothes.—The eye can, in its survey, take in the arrangement of the patient's clothes. So long as they are neat and clean, the patient's attention is clearly not taken away from his, or her, appearance. When indifference to the dress is exhibited, then there is either some disease of the cerebral hemispheres setting in, or the patient is too ill, or too absorbed, to attend to the dress. The drunkard is first dirty, then unwashed with unbrushed clothes, and then ragged: alcohol is gradually depriving him of care as to appearances. In failing brain-power the same indifference to the raiment is manifested. The coat-collar is not turned down, or the waistcoat is buttoned awry, or the trousers are partially unbuttoned, or the shoe is down at heel. At times in glycosuria the marks of the urine are left in white sugary streaks, or in splashes on the lower portion of the trousers. Or in distinct diabetes the trousers may be seen even rotten, with the saccharine urine, at the fork. In incontinence of urine the trousers are wet with the dribbling fluid.

In a drinking bout, a fit of drunkenness lasting over some days, the drunkard may attire himself grotesquely, as do certain lunatics.

Indeed, the clothes will sometimes reveal a good deal.

The Manner.—This, too, is also suggestive at times. Country people, out much in the open air, have a certain rude health and brusqueness of manner contrasting with the sedate quietness, which rather characterizes those who lead a sedentary life, or serve behind the counter. Then there is the bustling irritability of sufferers from suppressed gout, as well as the restlessness which tells of anxiety. The chronic invalid usually carries an air of languor, with a certain self-consciousness. The lady with the vapours is often got up with strict attention to appearances. The masturbator usually has an eye which is ever unsteady, with an averted gaze. It is an eye you cannot 'catch;' it eludes all attempts to fix it. The same is seen in many

girls when pregnant; though at times they assume an attitude of defiant indignation, or maybe of brazen-faced impudence.

The Vascularity of the Face.—Having completed the general survey of the individual, it is well to study carefully the evidences furnished by the vascular supply of the face. So far as the hue of the skin is concerned this has been spoken of before (p. 16).

Now something more precise may be discussed. There may be vascular fulness from an overcharged circulation, or plethora. Or the high complexion may be due mainly to exposure, as is seen very marked in some engine-drivers. It indicates arterial fulness whenever the colour is crimson. It is much darker and purple in hue when the vascularity is venous. Exposure calls for a free vascular supply to protect the tissues against the effects of cold. Or pallor may tell of an indoor occupation rather than of ill-health: one who bends long hours over the desk, or who lives the live-long day in a mill or a printer's office, can scarcely be expected to exhibit a very high complexion. There is the flush of hectic, which is to be distinguished from the peach-bloom of florid health, of 'bloodvessels largely developed over the malar bones and varicosed,' which Professor Laycock held to indicate the sanguine gouty cachexia. The terminal branches of a small artery will sometimes be seen to pierce the skin abruptly, and course along the surface. These dendritic twigs are part of a wide-spread atheromatous change in the arterial walls; and so often furnish most useful information. They go usually with a hard pulse and thickened arteries, of which the temporal may be distinctly visible; an hypertrophied left ventricle, and an accentuated aortic second sound—the changes, indeed, of the granular kidney. The correlated physiological state is that of a copious flow of urine, usually pale; and a tendency to get up in the night to empty the bladder. This last association will often enable the medical observer

to put a pertinent question, which impresses, as it ought to do, the patient very considerably. Aortic dilatation, aneurysm, palpitation (unconnected with effort), angina pectoris, and apoplexy (from ruptures) go with the tense artery of the 'gouty heart' (p. 9).

The temporal artery, though inarticulate, may at times speak volumes. It may be seen tortuous, thickened, and elongated. Each pulse may be visible in it, even without aortic regurgitation. The wall may be very thick, and comparatively soft and compressible; or it may be thinner, but hard and wiry. The first goes with well-nourished gouty individuals; the latter with the spare subjects of visceral cirrhosis. The condition of the visible temporal artery ought always to direct the attention to the rest of the arterial system. In aortic regurgitation the elongation and the widening of the arterial lumen is often to be seen very distinctly, as 'the ball of blood is shot' along the vessel; and the sudden collapse of the vessel calls up the sensation given to the finger in this lesion—the 'water-hammer pulse,' or 'Corrigan's pulse.' Such pulse tells of insufficiency, with little or no obstruction at the aortic orifice.

In certain young men who have led very studious lives, the temporal artery may be at once conspicuous and tortuous without any significance; especially if there be little subcutaneous fat. On the other hand, in some young men the temporal artery is seen thickened and tortuous under a parchment-like skin tightly stretched over the tissues beneath. On several occasions this species of temporal artery has been found linked with syphilis; and when seen it is well to look for a syphilitic rash, or the stain of one.

Venous fulness is revealed in a 'mitral flush' and injection of the face; or in lividity with blueness of the lips, and bloated features.

In arterial anæmia the lips and the inner surface of the lower eyelid are very pale and exsanguine.

Such, then, is the information gleaned by the eye as it takes in point after point in its inspection of the patient : an inspection with far wider range than the inspection of the bared chest—though that is valuable enough in its turn. It cannot all be learnt from a mere perusal of a printed page. The reader must think it over until it has become a part of himself, of the information which he carries about with him habitually. The whole system is a hieroglyph in itself which has merely to be learnt, to the great benefit of him who takes the trouble to interpret it. Semeiology is the special training of the eye, 'which can only see what it carries with it the power to see.' Little indications may point the direction which the inquiries should take ; often saving much bootless questioning, as well as giving the clue to well-placed questions. And well-put judicious questions tell the patient, and even more the patient's friends, that the medical man knows what he is about ; while vague aimless questionings neither succeed in gaining confidence, nor deserve to do so !

Not only may much be learned by the eye as to the physique of a patient, but many psychical traits are revealed to the educated gaze. This may stand the medical man in good stead when dealing with strangers ; maybe in complicated matters where it is as well to 'walk warily.'

'How class you your man ? as better than the worst ?
Or seeming better, worse beneath that cloak ?
As saint or knave ? pilgrim or hypocrite ?'

Thus wrote that novelist who possessed the keenest insight into human nature, George Eliot ; whose works all medical men should study carefully.

Such, then, is the information to be gathered by steady systematic inspection of the patient. The fulness of the bloodvessels, the inherited constitution, the presence of a source of cachexia, reveal themselves to the educated eye ; matters of great value in other respects than mere diagnosis, but for it often invaluable.

CHAPTER III.

THE TONGUE.

THE study of the surface of the tongue is probably as old as medicine itself. The aspect of the tongue is so modified by different morbid conditions, while it is so readily scrutinized, that this is no matter for surprise. It is the only portion of the alimentary tract which admits of easy scrutiny. It has been held that the condition of the tongue, the part observable, is suggestive of the condition of the rest, the non-observable portion of the mucous lining of the alimentary canal. Probably most persons will admit that there is much to be said for this view; though there may be circumstances which tend to invalidate the value of its evidence upon some occasions. For instance, redness of the tongue may occur without inflammatory conditions of a portion of the gastro-intestinal canal; as these may exist without notable redness of the tongue.—(Flint.)

The manner in which the tongue is protruded is often highly suggestive. When the patient is in the typhoid state, whether in connection with true fevers or prolonged pyrexial states which have led to uræmic conditions, the tongue is protruded slowly; and often only after loud and repeated requests. The intelligence is deeply clouded here; and the tongue is perhaps only withdrawn after similar requests. If at the same time it is obviously tremulous, then it suggests great muscular debility, and in so far is of bad omen. It may also be observed to be tremulous as a part of the condition known as delirium tremens; or it may be tremulous in certain nervous persons. It is tremulous

frequently in lead or mercurial poisoning. A child almost instinctively protrudes its tongue when in the presence of a medical man; and Austin Flint makes the observation—‘It is a curious fact that patients will frequently protrude the tongue when they cannot be made to do aught else, owing to the state of their mental faculties.’

The indications furnished by the tongue as to more especial states of the nervous system will be reviewed in Chapter X.

The first thing to be done is to induce the patient to put out the tongue fully. It is no use to study the tip, which is often clean when the rest of the tongue is thickly coated. The tongue must be put out so as to bring the circumvallate papillæ into sight. Females often fail to do this when requested. They seem to desire to keep ‘the unruly member’ from observation. Then babies cannot be told to put out the tongue; or if told would not comply with a request which they could not comprehend. With these it is well to adopt the plan recommended by Sir William Jenner, viz., put a drop of fluid, all the better if viscid like syrup, upon the little one’s chin. The tickling sensation so produced will lead it to try to remove the source of irritation by the tongue; and while the tongue is so employed, its condition may be studied without any disturbance to the child. When a mutinous child obstinately refuses to put out its tongue, a little pressure on the ramus of the jaw will usually induce it to open its mouth.

In children the tongue is not usually much furred; but it may present the evidences of stomatitis, or aphthous patches, telling of general debility. These aphthous patches are spoken of vulgarly as ‘the thrush;’ which is regarded as a disease itself, rather than as the outcome and evidence of a state of adynamy.

Then the tongue is dry in diabetes mellitus, or other condition where the bulk of urine is large; in cases where the patient sleeps with his mouth open; and is also found dry in

acute pyrexia. Or this may be due to the frequent inspiration in embarrassed respiration. It may be so dry as to be almost horny. In the typhoid state it may be thickly coated with a brown fur, and even fissured. In some epidemics of fever the tongue becomes coated with a black fur—'as black as your hat,' I have heard my father say of the tongue in the severe outbreaks of fever (typhoid) in the dales of the Lake Mountains in past times. The surface of the tongue may be stained by iron, black-currant juice, bilberries, elder juice, Spanish liquorice, or tobacco, or treacle and tea taken together; or it may be livid in cyanosis, pale in anæmia, or yellow in jaundice; or it may be abnormally red from the recent shedding of an epithelial coat. It may bear the marks of syphilitic patches, or stomatitis; or a chancre may be found, or a commencing cancer; or an ulceration from a jagged tooth, or an accumulation of tartar behind the front teeth of the lower jaw.

Or the edge may be indented from long pressure on the teeth. This may indicate hebetude, as in comatose conditions where the tongue has lain long in one position undisturbed; or may be due to a swollen state, part of a general condition of asthenia. It is liable to be so swollen and indented in females who are the subject of menorrhagia, with or without leucorrhœa. When so swollen and indented, and also presenting a sort of silvery sheen, it is very suggestive of such combinations. Or the tongue may present deep fissures, which suggest syphilis; or the scars of bites inflicted in epileptic seizures. A number of slight fissures are often exhibited on the tongues of persons who drink freely of very hot fluids, as tea, for instance; though these are not pathognomonic.

The great clinical interest in the appearance of the tongue lies, however, in the matter of whether the tongue be coated, furred, or frosted; or be bare or raw, that is, denuded of epithelium. Especially for the matter of treatment in any case is the condition of the tongue of cardinal moment.

If it be raw, one line of treatment is indicated ; if furred, another. For instance, in a case of apex-consolidation with active symptoms—what, indeed, might fairly be termed phthisis pulmonalis in an early stage—the condition of the tongue is, to my mind, the indication for treatment. If it be furred, with loss of appetite, then a bitter infusion with an acid is indicated ; but if raw, this will quickly make the patient worse. Whenever the tongue is either denuded of epithelium or covered with young epithelium, then alkalies with bismuth are called for. But it is not only in phthisis in its early, or indeed any stage, that this rule is to be observed ; it should be made a rule in practice to be steadily adopted in all cases, unless there be some very strong reason indeed to diverge from it. The old practitioners who pinned their faith to *Mist. Tragacanth Co.*, with an alkali in the treatment of phthisis, had a great deal of reason on their side. Careful scrutiny of the condition of the tongue and thoughtful reasoning therefrom is far more important, to the patient at least, than any amount of physical examination, in the bulk of cases. This last will tell of the extent of the mischief, even whether it is static, progressive, or softening is going on, or that a cavity has been formed—will, indeed, go far to establish the diagnosis. But we cannot treat phthisis pulmonalis by any specific remedy : we must follow the indications furnished, or otherwise ‘treat the symptoms.’ And this I say with my foot down solidly ; yet in full vivid consciousness that it will be condemned by those who think that the management of phthisis lies in ‘diagnosis,’ after which the treatment evolves itself by a natural process of sequence, as the flower follows the bud, or the chick is developed from the egg.

The furred or coated tongue is not indicative of any special malady. ‘A coated tongue occurs in a host of diseases. It is evidence that the system is disordered, but it does not point to either the seat or the nature of the malady.’—(Flint.) Some persons never have a clean tongue,

yet seem to have good health. Heavy smokers have furred tongues, especially in the mornings. Tipplers have white, or yellowish-white tongues; and after a debauch the tongue is often very thickly furred. Such tongue, when also tremulous, is very suspicious; no matter what the professions of its owner! In atonic dyspepsia the tongue is white, pretty uniformly over its surface. Here there is usually constipation. Flint also describes a 'malarial tongue,' which, as it may interest other than English readers, may be quoted here: 'A uniform, white and thin covering, extending over the whole dorsal surface, giving an appearance as if the surface were chalked or covered with white paint, is often observed in patients with intermittent fever, and is sometimes called a malarial tongue. This is somewhat characteristic.'

When the tongue is uniformly white, and at the same time there is languor, a sense of malaise, with shivering, then there is some acute fever looming, or it may be acute inflammation. When it seems clean, but a yellow stain is visible on putting the tongue in a side-light, and looking along it as a dyer does with a skein of silk or wool, then the liver is disordered. At other times there is a yellow or brown fur, mainly up the middle of the tongue, with a bad taste in the mouth, sometimes bitter, sometimes hot, on awakening in the morning; and here the liver is certainly not working properly. Here most men of clinical experience would admit the liver to be at fault, even if they will not allow the staining to be due to bile. Tauro-cholic acid may not stain, but it goes with the staining matter. The bitter taste may not be due to bile; but it is probably due to those by-products of digestion, such as Wm. Roberts found to be produced towards the completion of the digestive act when carried on out of the body. By regulation of the dietary, and measures directed to the liver, such condition will usually be readily relieved. The taste is not due to the fur, which may be thick, yet devoid of taste; it is something superadded to the fur.

The fur consists of dead epithelium-cells, particles of food, vomited matters at times, dust inhaled by the breath, and parasitical growths. Consequently, there is little absorption possible through such layer. When seen upon the tongue, it is believed to exist upon the whole intestinal tract. 'Watch a case of typhoid fever, and see what immediate improvement follows the shedding of the dead epithelium with which the mucous membranes have been coated—a change which is announced by what is called the "cleaning of the tongue," but which foreshadows much more, in fact the cleaning of the whole intestinal tract.'—(King Chambers.) To clean the tongue is to promote absorption; that is a clinical fact testified to by universal experience. This layer of dead epithelium-cells must be removed. Consequently, we carefully inspect the tongue to see if it 'is cleaning,' in acute disease, and in convalescence. When the tongue commences to clean, we look upon it as the herald of a better state of things; the crisis is past, and the system is rallying. When the fur again collects, we look out for a relapse. Often, however, this is nothing more than the indication of an overload of the digestive organs, from well-meant but mistimed efforts to push the convalescence, to 'make the patient strong;' a by no means uncommon occurrence in this age of cramming the sick and weak. When the tongue is seen to be cleaning, then the prospect is good. The cleaning process usually commences at the edges and spreads therefrom; a strip of fur being left along the mesial line, more particularly towards the base of the tongue, the last to go. It may not be the practice in hospitals to examine the tongue every morning, but it is usual to do so in private practice; and a very good rule it is, too.

One of the best evidences of returning power in a patient who has been acutely ill, is the power of the mucous lining of the alimentary canal to shed its coating of dead epithelium; of which the condition of the tongue is the accepted outward visible sign. Of old it was customary to aid the

natural efforts by a dose of calomel at bedtime; nor was this 'bad practice,' though opposed to our present notions. Sometimes, no doubt, nature could achieve this without any such aid; and the following case impressed me very powerfully early in my professional career. A boy was ill with threatening enteritis. He was progressing favourably, and on the evening visit it seemed desirable to administer a calomel powder; as my father certainly would have done. But the figure of John Hughes Bennett loomed up, and I decided to leave the case alone. Next morning the boy had had two copious semi-fluid motions, and the tongue was quite clean. Had he had the powder, unquestionably it would have got the credit of this change. Admitting this freely, I am now more inclined to look upon this as rather an exceptional occurrence; and to veer round to the old practice of giving a calomel powder after opiates have been administered, and the tongue is foul, rather than waiting to see what nature can do unaided.

(And here a slight digression may be permissible. The treatment of inflammatory conditions by calomel and opium, the plan introduced by Dr. Hamilton, of Lyme Regis, has unquestionably done much harm; so much that it has almost disappeared. Yet a word may be pleaded for it. It was the abuse of the plan, the routine giving of repeated doses of calomel without thought or discretion, which is to be condemned—just as any other blind following of any plan is to be condemned—rather than the addition of some calomel to free doses of opium! It is 'misuse' which leads to 'disuse.' At the risk of being designated a *laudator temporis acti*, a plea must be put forward in favour of that dose of calomel at times. Whenever opium has to be given repeatedly for some time, the tongue becomes furred, and the appetite vanishes. This, it seems to me, is the result of the unsought but unavoidable action of the opium upon the liver; while there is usually constipation from the effects of the opiate upon the vermicular action of the bowels. It

is well, then, in strong organisms, to give some mercurial, which acts upon the liver, and cleans the tongue after repeated doses of opium.* The impression is strong within me that the freedom from such results with Dover's powder is due to the union of the ipecacuan with the opium ; which keeps the liver in action. The addition of some aloes to night-pills containing opium has seemed to me to obviate the ill-effects of liver stagnation and constipation to a great extent. This discussion may seem, at first sight, out of place ; but surely diagnosis is not thrown overboard when convalescence sets in ? It is as important to attend scrupulously to the physiological data in convalescence, as in an earlier date. And the condition of the tongue is in many respects the finger-post of the convalescent stage. When opium must be given in repeated doses, it is well to give therewith some hepatic stimulant, to obviate its lethargic action on the liver. That is the moral of this digression !)

So long as the tongue is foul, or tinged with the colouring matter of bile, it is well to withhold chalybeates. Iron given before its appropriate time only upsets the liver and disorders the digestion. Neither is it desirable to administer iron so long as the epithelial coating of the tongue is imperfect. It is just as desirable to watch the effects of remedial agents as of the disease upon the system generally, and the primæ viæ in particular, in order to make a correct diagnosis of the patient's state.

Mechanical means of cleaning the tongue are useless as remedial agents, though often such cleansing is very grateful to the patient. In acute conditions and in great debility, such cleaning of the tongue is pleasant, and especially so when accomplished by means of vinegar or lemon-juice ; and the cleansing process may well include the teeth. But as to any curative effect to be looked for from such measures it is nonsense : though some persons with habitually foul

* Mercury was the only well-recognised hepatic stimulant of that day.

tongues spend much time in cleansing them, only they do not go the right way about it, viz., to attend to the conditions upon which the state of the tongue causally depends.

In scarlet fever the tongue often presents a peculiar appearance known as 'the strawberry tongue.' Here there are enlarged red papillæ prominent, like the seeds on a red strawberry; in other cases these papillæ stand out through a white fur, and then the appearance resembles a white strawberry with red seeds on its surface.

The opposite condition of the 'raw,' or 'bare,' or 'irritable' tongue has not had that attention bestowed upon it—by medical writers at least—which its importance, in my opinion, deserves. Sometimes the greater portion of the tongue, especially along the centre, is smooth and glazy in appearance, as if papillæ and epithelium alike had disappeared, except at the edges; at other times the tongue looks unnaturally clean, and as if its epithelium was young, or only half-grown—it is too smooth, but not glazed. In both these conditions there is great gastric excitability, often extending to vomiting. Bland food, a milk dietary, or milk with farinaceous matter, are imperative. Then bismuth with alkalies, with or without opium as the case may be, is the medicinal measure to be adopted and steadfastly adhered to. No matter what may be the disease affecting the patient, this is the line to be taken when the tongue is denuded of epithelium. If the medical man is lured away by the apparent necessity for attention to some other matter, say a mitral lesion, where he might wish to give digitalis and iron, for instance—certainly a laudable wish, he errs; he will find it prudent not to take the step until the condition of the alimentary canal will permit of it. Disaster after disaster has followed divergence from this rule in my experience, dating back almost thirty years (for I was apprenticed to my father in 1854, and have been familiar with sick people ever since, except when at school). First the disaster occurred with myself; after that with others.

There is, it seems, a 'murder-stage' of medical education when a man is acquiring that knowledge which no medical school can give him. Gaining it for himself: with some advantage to the undertaker in the meantime! Any man may make a blunder from an ignorance which cannot well be helped, and which is not blameworthy; but it is going on blundering without finding it out, which is so much to be deplored in every way. Therefore I wish to impress this matter upon the young practitioner in his own interests and in those of his patients; not desiring him to attend thereto for the gratification of my vanity, nor to believe it because it happens to be written here. Follow, then, the good old time-honoured plan of attending to the *primæ viæ* so long as they require it, and letting other matters stand in abeyance—no matter, almost, how urgent the latter may seem to be. With a clear head, cool judgment and a resolute will, with the decision begotten of knowledge indeed, hold on with a firm hand on the wheel, and steer the case along its proper course. Some lines by Oliver Wendell Holmes suggest themselves here, and, though quoted in another work, are so appropriate they must be given. A barque is in 'Sun or Shadow' alternately:

'Yet her pilot is thinking of dangers to shun—
Of breakers that whiten and roar;
How little he cares, if in shadow or sun,
They see him that gaze from the shore!
He looks to the beacon that looms from the reef,
To the rock that is under his lee,
As he drifts on the blast, like a wind-wafted leaf,
O'er the gulfs of the desolate sea.'

The grand old teacher is always worth reading, especially by members of the medical profession, who will never fail to profit by study of him. Bear him in mind when tempted to attend to anything else than the leading indications in a case. Watch the tongue, then, as the measure of the success attending your efforts when there is great irritability

in the intestinal canal. Diagnosis applies to the case generally, not merely to the morbid change which constitutes the disease (proper): and the varying condition of the tongue is a physiological factor in diagnosis of the greatest moment in acute conditions; whether occurring in individuals previously healthy, or cropping up as intercurrent affections in the course of a chronic case. To meet the varying exigencies of a case as they crop up, is quite as important as to make a diagnosis of the malady. The latter is, to a great extent, a matter of hospital education; the first tests the individual as to his capacity to think and act for himself in emergencies. A good medical man is like a skilful soldier; he must be able alike to plan a campaign and fight a battle, in order to wage successful war with disease in its varying phases.

The reason why it is so desirable to maintain the integrity of the epithelial lining of the alimentary canal, is demonstrated by the following quotation from Professor Michael Foster: 'After a meal, the epithelium cells of the villus are found crowded with fat. Since the striation of the hyaline border of the cells is not due to pores, as was once thought, the particles must have entered into the cells very much as foreign particles enter the body of an amoeba. The epithelium may, in fact, be said to eat the fat.' This tells of the importance of maintaining the epithelium in as perfect a state as is possibly attainable, in cases where the nutrition is imperfect; notably, therefore, in phthisis and other wasting diseases. In acute conditions the absorption of other matters of our aliment is effected by the condition of the epithelial lining of the intestinal canal. The soluble matters of our food (sugar, peptones, and salts) pass through the cylindrical epithelium of the intestinal villi: 'the intestinal mucous membrane permits readily of the passage of water and of soluble matters' (McKendrick). Indeed, these structures play a great part in the absorption of soluble matters from the contents of the small intestines: 'it is generally believed

that absorption of chyle is really effected by the epithelium cells of the villi' (Kirkes).^{*} Now, in acute conditions, any shedding of the epithelial layer of the intestinal canal strikes directly at absorption; and therefore our first duty is to maintain the integrity of the epithelium. If the power to take up aliment is in abeyance, the patient will quickly sink. There may be powerful incentives to push some other line of treatment; but, whatever they may be, they cannot outweigh the necessity for maintaining the absorbent powers of the intestinal lining membrane. 'Make it a universal rule that the special medication is never to interfere with or take the place of the supply of the materials of life' (King Chambers). Steadily watch the tongue, and by its condition set your sails from day to day. If the tongue grows more raw, either the treatment is not sufficiently rigorous, or the case is going downhill despite all your efforts; and when aphthæ or stomatitis show themselves, the danger is imminent. On the other hand, if the epithelium grows apace, and the tongue loses its 'beef-steak' or its 'glazed' appearance, and regains its normal aspect, then the case is going on well. By scrutiny of the tongue (together with the patient's position in bed, the timbre of his voice, and the grip of his hand), the young practitioner will be enabled to say whether the patient is better or worse, in answer to the inquiries put to him each day; a matter of diagnosis which old practitioners will tell him is of the greatest moment in acute conditions imperilling life.

When the brown fur of the typhoid condition is growing browner and drier, and the sordes on the lips becoming thicker (the patient getting more on his back and into the middle of the bed, the eye growing lustreless and the hand

^{*} The reader may smile at a quotation from Wm. Senhouse Kirkes (1860), but more recent works in physiology seem to take the absorption of truly soluble matters by the epithelial layer for granted; and discuss the method of absorption of fat at length, as the now interesting matter.

listless), then the prospects of life are rapidly being blotted out. When the surface of the tongue becomes moist, and the fur begins to clear away from the edges, then the patient belongs to the living; if along with this the position is changed to the side, and urine begins to flow, then the prospects are brightening. The condition of the tongue is the first thing to observe, after which the other matters may be noted; and according to the indications will be the remark, 'You are feeling a little better to-day;' or the other, fraught with significance, 'Our poor friend is not so well to-day:' all of which young men 'fresh from the schools' may hold to be little better than twaddle; but ten years of actual practice and experience at the bedside will probably heighten their estimate of its value.

In relapsing fever there is often a small triangular space on the tip of the tongue, about half an inch along each of its three sides, which is cleaner and freer from fur than the rest of the tongue-surface. This I have seen both at home and in Germany. It may, when present, have a high diagnostic value in a doubtful case seen for the first time.

Coldness of the tongue is indicative of the moribund condition, and especially in the algid stages of epidemic cholera (Flint).

Some practitioners not only examine the tongue carefully with the eye, but feel it studiously. This no doubt impresses the patient, and is sometimes done for effect. It may not be necessary to call in the aid of the touch, but the eye should certainly be vigilant as to the matter of the tongue; especially in acute conditions, when it must be continued every day or oftener.

Sometimes the tongue will be seen to clean by casting off its brown fur; but it remains raw or 'beef-steaky,' from inability to grow a new epithelial layer. Here it is well to be guarded about the prognosis, for the rally is but imperfect; and prognosis surely rests on accurate diagnosis! The reappearance of any browning indicates a return of the

typhoid or uræmic condition; or, maybe, the effects of opium. Whenever there is a brown shade on the tongue, it is desirable to look to the medicine as well as to the patient.

Now, the youthful reader may think that there is much in this chapter which scarcely belongs to diagnosis. But the diagnosis of the patient's state in acute conditions imperilling life, is as much true 'diagnosis' as is the correct discrimination of his special malady; and is most important, as he will find. He may hold, too, that there is too strong a leaning to the therapeutic aspect of the case. Perhaps so; but possibly he will forgive this after perusal of the following paragraph: 'On stating in consultation an opinion that some viscus is chronically degenerated, one is often met by the remark, "Well, what is to be done? We cannot cure that." Very likely not; then try and find something else which you can cure. In the great majority of your patients, you may find this curable something in functional impediments to the entrance of nutriment into the medium of assimilation; and when once you can get nutriment in, it will act as the best medicine. Do not, therefore, give way to despair, even after it has become certain that the principal viscus which gives a name and origin to the disease is incurable. And repress any conscientious fancies that you are not fairly earning your fees in giving careful attention and advice, though you prescribe little for the organ mainly affected. It is never too late to try and administer to the failing organ the most potent of all medicines, the healthy human blood of the patient himself.' Such is the outspoken expression of Dr. King Chambers, whose words will command the respect of all. Further, to act as he advises is surely to earn the fee tendered, as compared to pronouncing an opinion as to the nature of the malady, forbidding all hope; and going away without trying to see if something or other may not be possible in the patient's interests. Diagnosis surely involves treatment as well as prognosis.

There are some other matters which are so linked with scrutiny of the tongue that they may be considered here. Inspection of the tongue affords usually an opportunity for noting the oral cavity. The eye may note whether the teeth are good and sound, or not—a matter not unimportant in dyspepsia; nor yet in facial neuralgia, or other nervous conditions.

The Roof of the Mouth.—This is highly arched in imbeciles. It may be imperfect as a congenital defect, or have been removed by syphilitic ulceration.

The Tonsils.—These may be seen enlarged, or inflamed, or ulcerated. In acute disease there may be the film of diphtheria or scarlatina. When there is ulceration, it is well to look to the soft palate; if a grey ashen ulcer be seen there, then the diagnosis of syphilis is more than conjectural.

The Uvula.—This may be long, and be the cause of persistent intractable cough. It may be absent, having been snipped off by the surgeon, or eaten off by syphilis.

The Fauces.—Here again there may be evidence of syphilis. Or there may be follicular ulceration, or enlargement with hypervascularity; or there may be the sore throat of putrid origin, or 'hospital sore throat.'

The Pharynx.—This may share in the condition of the fauces in the above-mentioned states; or there may be 'clergyman's sore throat.' Enlarged follicles, a varicose condition of the pharyngeal vessels, with hypervascularity and either dryness and irritability, or the secretion of mucus giving rise to hawking, may result from indigestion; at other times the local condition is not so associated.

Then there are transient conditions of sore throat, where there is the redness of hypervascularity. The following description of catarrhal throat by King Chambers ('Clinical Lectures') is so vivid, and so forcible, it calls for quotation: 'Look at your catarrhal throat in a mirror—what do you see? The surface red, puffy, and with the component parts, such as the uvula, enlarged. There is also poured out a quantity of slimy material, which you well know

by the name of mucus. Examine in a microscope a little of the mucus, and you will find it made up of minute balls of transparent jelly with a granular aspect, technically called "exudation globules," "mucous globules," and "pus globules," floating quite free, and rolling over and over without any tendency to adhere together. They are young cells, or rather nuclei. They are the forms assumed by all liquid living material which under the influence of life is being transformed into a solid; they are infant tissue strangled in its birth. Instead of uniting into a continuous web to clothe with epithelium the surface of the membrane, they float off helpless from deficient vitality. The business of mucous membranes is to be covered with epithelium, not to throw off mucus; and when they are doing the latter they are so far forth in a state of diminished life.'

Or there may be a pharyngeal abscess, or a quinsy.

Disorders of motility and sensation will be discussed in Chapter X.

Beyond what the eye sees the nose makes its note when the oral cavity is examined.

Smell.—The breath may be offensive from articles of food, as the onion, or garlic. Or decomposing food may be lodged amidst the teeth, or the teeth may be carious. Or there may be foul ulcers causing a smell. Or the metallic smell and taste of spongy gums, especially if due to mercury, may be present. Or the breath may tell of alcoholics recently taken; or that stale offensive breath of the drinker may testify to excess, however voluble and solemn the protest that such is not the case. Then the breath is habitually tainted with some persons, while in others it is only offensive in times of mental worry, or from indigestion; or maybe both combined when the breath is very disagreeable. The offensive breath of ozæna, of gangrene of the lung, and foetid bronchitis—due to changes in the fluid in bronchiectasis—is known to all.

Having made the scrutiny of the tongue, the next thing to be observed is the respiration.

CHAPTER IV.

THE RESPIRATION.

THE respiration is worthy of study, as from it much may be learned. For instance, a patient is found with a loud mitral murmur, maybe regurgitant, or more probably stenotic. The loudness of the murmur carries with it no measure of the extent of the mischief; for that we have to fall back upon the physiological factor. What is the effect upon the respiration? That is the test! Does the patient breathe calmly; is the breathing accelerated, or distinctly embarrassed by effort, or not? If the patient breathe calmly when at rest, and there is no unwonted effect produced upon the respiration by effort, then there is but a slight lesion; if, indeed, there be any at all. The murmur may be entirely free from any sinister indications.

The respiration may be normal, or it may be rapid, or it may be laboured.

Rapid Respiration.—The thorax of an ordinary man contains 250 cubic inches of air, known as ‘the residual air.’ In the act of respiration so much air is expired, and so much external air is inspired. The expired air contains more carbonic acid and less oxygen than the outside air. About twenty-six cubic inches of air are taken in, and given out, at each respiratory act. The normal rate of inspiration is about eighteen times per minute. There is a reservoir of air in the lungs by which the chemical interchanges can be carried on while the breath is held, as in diving. To hold the breath for one minute is no pleasant feat, but the Indian

pearl-diver can keep under water for a much longer period. Four minutes' immersion, and the person is dead, as a rule. The breath can be held so long as such interchanges can be carried on as fairly depurate the blood of its carbonic-acid gas; when the carbonic acid in the blood reaches a certain point, the respiratory centre flashes out an efferent message to the muscles of inspiration, and they respond. Men under torture which they knew was meant to be continued to death, have tried to kill themselves by holding the breath; but they have never succeeded. In the drowning person this involuntary respiration draws a quantity of water into the air-passages; and probably repeated respiratory acts, under the imperious dictates of the respiratory centre, fill the thorax with water till the body loses its buoyancy and sinks.

When from any reason the chemical interchanges are insufficient to depurate the blood of its carbonic acid, then the accumulation of this carbonic acid excites the respiratory centre, and violent respiratory efforts are made; until, by increased respiration, the residual air is sufficiently purified, so that the normal interchanges are regained. Thus after holding the breath a few deep inspirations are necessitated, after which all is once more calm. If the respiration be excited by a more prolonged demand, as a sharp run, then a longer time of exalted respiration is required for the normal state to be regained. Consequently, when the thoracic space is impaired, as by pneumonia or congestion of the lung, the diminished residual air requires more frequently 'the tidal air' to maintain its purity; and so the breathing is accelerated, or rapid.

Consequently accelerated respiration tells of excess of (1) blood; (2) connective-tissue; (3) water, in œdema of the lung or pleuritic effusion; (4) pus in empyema; (5) a morbid growth; (6) air in pneumothorax; or (7) mucus in bronchial catarrh. (Air in emphysema involves rather another modification to be discussed shortly.) Of course the mere increase

of rapidity cannot indicate the nature of the cause of it. Excess of blood may be due to inflammation of the lungs; to congestion of the lungs (localized); or to fulness of the pulmonic circulation from a mitral lesion. Excess of connective-tissue may occur as fibrosis, or as pulmonary tuberculosis. Excess of water is found in cedema of lungs, or effusion into the pleural cavities; or maybe into the pericardium. Excess of pus is usually found in empyema, but an abscess might cause it. A morbid growth, as a tumour, or a cancer, will accelerate the respiration in proportion as its size impinges upon the thoracic space. Air elsewhere than in the air-passages will produce the same result of diminution of the thoracic space. Catarrh of the bronchial lining membrane will also accelerate the respiration by diminishing the lumen of the air-tubes; also blocking some of them temporarily.

Careful estimation of the rate of respiration will often materially aid the observer to read the physical signs aright. Especially is this the case when the peccant matter is either disseminated over the lungs, as in general fibrosis, or the neoplasm is too deep-seated to affect the percussion-note; or there are internal cavities, or bronchial dilatations; or there is a large accumulation of mucus in the air-passages. Indeed, the rapidity of the respiration will tell him more exactly the *amount* of the disturbing cause than will percussion or auscultation at times. He must, however, compare the ratio of the respiration to the pulse, which is normally 1 to 4; the first being 18 and the latter 72. It is well, indeed, to do this habitually; and if such practice obtained many an error would be avoided. If the pulse and the respiration both be high, then there is either some febrile condition or nervous excitement; something which affects both alike, and probably the temperature too. (But of this last anon.) Such use of the watch will usually tell how a case is going on. If the breathing becomes accelerated out of proportion to the pulse rate, then it is high time to

look for something ; and 'something' will usually be found. Say the patient is in bed with mitral disease, for instance, and the respiration rises : then there is some special cause of diminution of the thoracic space, which will probably be found to be congestion of the bases of the lung, mostly at the back—the dependent part. If there be dropsy present, it may be cedema. The use of the watch will often put the medical man on his guard, and make him examine the chest when otherwise there might appear to be no especial call to do so. Also it will often relieve him, and still more the patient, from examination which is superfluous, troublesome, and yet negative of result. It may happen that a fidgety patient (very likely a medical man, who makes a very trying patient as a rule) may like a physical examination, and be dissatisfied without it ; but there are others who resent being disturbed without sufficient reason. To take the ratio of the respiration and the pulse will often, indeed commonly, tell whether a physical examination be required ; or may safely be dispensed with. If the respiration has been accelerated and falls, then it is fairly clear the infringement upon the thoracic space is diminishing.

The rapid breathing may be shallow, with little respiratory movement ; this is found with nervous states, and in some forms of phthisis. Usually in the latter case there is no great impairment of the thoracic space demanding accelerated breathing ; it is rather nervous than of organic origin in many instances, even when some consolidation is present.

Deep Respiration.—This is linked with other conditions within the thorax. In emphysema the patient will be seen fixing the shoulders, so as to enable the accessory muscles of inspiration to act more efficiently ; and then the sternomastoid muscles will be seen to stand out like cords, rhythmically as each inspiration is accomplished. If the patient be lying in bed, the character of the respiration is very instructive. The muscles at the top of the thoracic cage are seen to contract powerfully, while the abdomen rises.

The neck-muscles drag up the comparatively immovable and rigid thoracic case, while the diaphragm descends. The inspiration here is the antithesis of the swell and fall of a woman's bosom. (Why a woman's bosom? an unreflecting reader may ask. Because a woman's thoracic space is liable to be physiologically impaired from below by a gravid uterus; and when the full term of pregnancy is being reached, her respiration is almost entirely thoracic.)

In asthma the same laboured respiration may be seen. It may be cardiac asthma when the breathing is both laboured and rapid; or at other times, and more commonly, laboured and deep; or it may be true spasmodic asthma, with diminution of the lumen of the air-passages. When the air has to be forcibly drawn through narrowed air-tubes, then the breathing cannot well be rapid; it must be deep. Rapid breathing is incompatible with obstructed air-passages. They, at least, are unimpaired in rapid respiration!

The study of the character of the respiration in each case of thoracic trouble is highly interesting, as well as instructive. It is most easily carried out in large wards, where various forms of thoracic disease are lying side by side, when the character of the respiration in different forms becomes very manifest; and is, almost, in itself sufficient to indicate the malady, or the leading factor in a complex case.

Nor must the reader be under the impression that the typical 'barrel-shaped' thorax of emphysema is alone compatible with it. He will often be surprised to find extensive emphysema with the flat chest supposed to be peculiar to phthisis—the compensatory emphysema of Niemeyer.

The diaphragmatic breathing will depress all the abdominal viscera from the violent contraction of the diaphragm. Consequently the liver is displaced downwards, and this displaced liver might easily be mistaken for an enlarged liver by a careless observer. The emphysematous lungs overlap the heart, and abolish the area of cardiac dulness more or less completely; sometimes entirely. Abolition of the heart-

dulness, and diminution of the liver-dulness till it is only found at the very edge of the ribs, are indicative of confirmed emphysema.

(Emphysema of the anterior fringe of the lungs is very common in athletes, and those who have been subject to efforts at once severe and prolonged. Sometimes the emphysema becomes more general; this may be termed 'the athlete's chest.' It is most commonly found in rather undersized men, where pluck has tried to make up for muscular power. In time the whilom athlete becomes comparatively 'broken-winded' from emphysema, and is less equal to effort than an ordinary person. This is a matter the devotees of athletics had better take to heart. Emphysema from over-effort is as surely a clinical fact, as that aortic valvulitis is causally linked with prolonged severe muscular effort.)

Effect of Effort.—In relation to the matter of observation of the respiration, it is most important often to note the effect of effort. That we possess much spare lung for occasions—without which any unusual effort would be impossible—is well known. Consequently in many cases the respiration is calm while quiet is maintained; but any effort reveals thoracic impairment by the respiration becoming quick or laboured. Here there is not enough of mischief to affect the respiration while the patient is quiet; but it becomes palpable enough when any exertion is attempted. The circumstances which give rise to it are exactly those which affect the respiration while quiet, only not so pronounced.

That such should be the case with disease of the respiratory organs is readily seen. Nor is it difficult to comprehend why effort should produce shortness of breath in valvular disease of the heart, especially mitral disease; the dam of blood at that point is increased on effort, and so the pulmonic circulation is gorged, and thus the thoracic space is diminished for respiratory purposes. There is one

other condition not so apparent where the effect of effort is to produce breathlessness, and that is in pronounced conditions of anæmia. There the red blood-corpuscles are sufficient for the requirements of the system in quiet; but effort produces breathlessness, compelling quiet.

Nocturnal Dyspnœa.—In certain morbid states the patient is awakened out of sleep by a craving for air. In my own experience this occurs mainly in cases of chronic renal disease; still more when to such renal condition is added the effects of soporifics. Basham called them 'inexplicable dyspnœa.' What it is which palsies the respiratory centre in chronic Bright's disease is not known; but something does. The elimination of carbonic acid is checked until it accumulates to the extent of rousing the respiratory centre to extensive discharges, setting the accessory muscles of respiration into action; with the effect that the powerful inspirations rapidly get rid of the excess of carbonic gas in the blood: after which the breathing becomes calm, and the patient, ere long, drops off to sleep. When to this morbid agent, be it what it may, is added the action of an hypnotic, such loss of sensibility in the respiratory centres is readily intelligible. This nocturnal dyspnœa is allied in nature to the paroxysms of palpitation, by which some persons are awakened when the heart is not in its integrity. Distension of the cavities, usually the right, goes on until it provokes active discharges in the cardiac ganglia (these and the respiratory centre are the rhythmically discharging centres of the organism, see, 'The Antagonism of Therapeutic Agents, and what it Teaches,' p. 60), which set up pronounced muscular contractions; and then palpitation is experienced. Or the patient may awake, feeling as if going to die, the heart's action being imperceptible from a marked fall in the action of the heart in sleep: indeed fainting, or syncope, in sleep is not unknown. It is well to ponder over this nocturnal dyspnœa in relation to the two conditions—cardiac dyspnœa, or cardiac asthma, and Cheyne-Stokes respiration.

Cardiac Asthma.—The occurrence of cardiac asthma in the night not only alarms the patient, but also those in attendance upon him. It is usually seen with mitral disease, or failure of the muscular walls of the heart. The patient may have been sleeping soundly, when he awakens up suddenly with much embarrassment of the respiration. He sits up in bed gasping for breath, perhaps asking to be fanned; or he clutches the bedclothes convulsively, to fix the arms and shoulders so as to bring the pectoral muscles into play as respiratory accessories; and sits there, 'breathing for dear life.' The countenance tells of the distress he is enduring. The heart may be palpitating forcibly, telling of the energy of the contractions of the right ventricle—for here the right side of the heart is greatly distended. After a time the distended muscular wall recovers itself, and the patient, exhausted by the effort, falls back to sleep, or perhaps sits propped up; thankful the worst of the paroxysm is over, and yet far from being at ease! If the muscular fibres are free from degeneration it is surprising what the patient will endure and survive. He is quite sure another attack will finish him; but he survives another, and yet another. I remember a patient in Westmoreland, a quarry-mason, with a mitral lesion, to whom I was often summoned in the winter of 1868-69, in severe paroxysms of cardiac asthma, which lasted usually some three hours. He lived three miles away, and the attacks came on about two in the morning. So severe indeed were they, in spite of hot poultices back and front, hot spirits and water, ammonia, nux vomica, and digitalis (as well as a steady course of digitalis), that I frequently got out my lancet-case, and stood lancet in hand, ready to open a vein and relieve the right ventricle; if relief was not attained by the other measures. This, however, was never actually required. As spring went on the attacks ceased, the general condition improved from the enforced rest, and the patient went back to work; though past middle age. Ten years later he was working away;

never being laid up till the severe winter of 1880-81 gave him an acute attack of bronchitis, to which he succumbed. These paroxysms are very painful to witness; they are very exhausting, and if the medical man be either timid in his measures or inattentive to the indications, are fraught with great danger. These attacks are often strictly related to the patient's supper; a weight in the stomach, or a quantity of gas in it, pressing upon the distended right ventricle through the thin aponeurotic portion of the diaphragm, impedes its action, and pulmonary congestion with acute distension of the right heart follows; or the patient gets up to stool, and becoming chilled on getting into the cold bed, a paroxysm of dyspnoea is set up; and this may occur though a fairly good fire is maintained, especially in winter. It may occur at other times than in the small hours of the morning; but these are the ordinary times at which attacks of cardiac asthma manifest themselves. The injected features distinguish attacks of cardiac asthma from spasmodic asthma; and, as a rule, the patients are more seriously ill, though perhaps not more distressed!

Cheyne-Stokes Respiration.—This is a curious rise and fall in the respiration. Stokes describes it graphically (using 'apnoea' in a sense the opposite of the 'apnoea' of the modern physiologist): 'It consists in the occurrence of a series of inspirations, increasing to a maximum; and then declining in force and length, until a state of apparent apnoea is established. In this condition the patient may remain for such a length of time as to make his attendants believe that he is dead; when a low inspiration, followed by one more decided, marks the commencement of a new ascending and then descending series of inspirations. This symptom, as occurring in its highest degree, I have only seen during a few weeks previous to the death of the patient. The decline in the length and force of the respirations is as regular and remarkable as their progressive increase. The inspirations become each one less deep than

the preceding, until they are all but imperceptible; and then the state of apparent apnoea occurs. This is at last broken by the faintest possible inspiration: the next effort is a little stronger, until, so to speak, the paroxysm of breathing is at its height; again to subside by a descending scale! There is, indeed, an ebb and flow in the inspiration. An ebb till the accumulation of carbonic acid in the blood wakens up the respiratory centre, and the blood is fairly depurated; then the breathing falls again, and a re-accumulation of carbonic acid follows: and this recurs again and again. At one time this rhythmic respiratory derangement was held to belong to the fatty heart solely; but it is now recognised as occurring under a variety of circumstances. Personally I first saw it in a case of apoplexy (where the cycle of ebb and flow covered fifteen inspirations); next in a case of primary tricuspid disease. It belongs to vascular conditions, and to affections of the cerebral hemispheres mainly. It is also found in uræmia.

Both nocturnal dyspnoea and Cheyne-Stokes respiration are instances of failure of the respiratory centre, with accumulation of carbonic acid in the blood, which will well repay thought. They tell that stimulants to the respiratory centre are indicated. Nocturnal dyspnoea is a less grave condition than cardiac asthma, and is comparatively quickly over. It is also free from the grim associations of the Cheyne-Stokes phenomenon, which is 'a very bad sign' in any case.

Sighing Respiration.—This peculiarity has been termed sighing, or suspirious respiration. We sigh when abstracted in thought, or after the relief of suspense. It is a long breath indicating the stimulus of excess of carbonic acid in the respiratory centre. It is held to be suggestive of fatty degeneration of the heart, and is seen markedly in angina! 'Some of the worst cases I have seen have been those in which the only lesion that could be fairly presumed to exist was fatty or other degeneration of the fibre of the heart,

sometimes with, sometimes without, direct evidence of moderate or slight dilatation of the left ventricle' (W. T. Gairdner). Sighing or suspirious respiration should always direct the observer's attention to the condition of the heart and arteries.

Stridor.—Noisy, coarse, or shrill inspiration suggests some difficulty at the laryngeal orifice. It may be due to spasm in 'crowing croup' (laryngismus stridulus), or to genuine croup; to œdema of the epiglottis, or acute laryngitis, as a passing condition; or to chronic change in the structure of the larynx; or to polypi, as a more permanent state, with paroxysms of acute aggravation. False croup gives the ringing cough, not the croupy cough and respiration of true croup; it is, moreover, a condition infinitely less grave than true croup, and occurs at short intervals, which true croup does not. Yet the ear has to be trained to recognise the sounds of false croup. In chronic disease of the larynx the voice is more suggestive than the respiration; though there is stridulous respiration, with harsh or barking cough, and paroxysms of dyspnoea, at intervals.

Dyspnoea.—This is found with many different maladies. As a grave symptom in thoracic conditions, involving impairment of the thoracic space, it has been discussed before (p. 56). It is found, however, with laryngeal disease, with pressure upon the trachea (usually an aneurysm), cancer extending from the œsophagus, or an enlarged gland. When one or other bronchus only is pressed upon, then the dyspnoea is only marked on exertion.

When the lumen of the air-tubes is diminished it follows, as in spasmodic asthma. Frequently the spasmodic asthma has this association: A cold with swelling of the mucous lining of the air-tubes, by which the breathing is rendered hard; then the irritation of this dry tumid membrane sets up spasm of the bronchial muscular fibre, by which the condition of shortness of breath is accentuated with distinct asthma, taxing the powers very plainly. Dyspnoea, too,

belongs to bronchitis where all the tubes are lessened as to their lumen, and where many are occluded with phlegm. In chronic bronchitis, with emphysema, there is dyspnoea on effort, with shortness of breath always. In emphysema uncomplicated with chronic bronchitis such permanent embarrassment is found with acute paroxysms, due to spasm of the circular fibre of the air-passages.

The following case is full of interest: A well-grown girl, with an excellent thorax, was brought to me for suspected heart-mischief; as she was quickly out of breath on effort. The heart was all right. The chest was perfectly resonant. But on auscultation the respiratory murmur was deficient in the right lung, all over it. It was found that there was little movement of the right half of the thorax in respiration. It was clear the trouble affected the whole lung. It must be pressure on the right bronchus. A limited area of percussion-dulness was found over this bronchus. It was an enlarged bronchial gland resultant upon an acute, but not severe bronchial attack. The diagnosis of enlarged bronchial gland was no feat in diagnosis; it was simply unavoidable, except by gross carelessness. She has improved very slowly.

Dyspnoea may belong to the diaphragm, as paralysis of that muscle, or fatty degeneration of it, along with a fatty heart; or in conditions of malnutrition of the heart and diaphragm, which I have called 'heart-starvation,' not uncommon in grave conditions of mal-assimilation. In rheumatism or gouty inflammation of the serous coverings of the diaphragm a condition of embarrassed inspiration is found, from defective or arrested (by the pain it produces) action of the muscle. Then dyspnoea may be due to some condition outside the thorax. Whenever the descent of the diaphragm is impeded, then dyspnoea follows. Thus when the uterus rises high in the last weeks of pregnancy the breathing is embarrassed. In large ovarian cysts the diaphragm may be so pushed up as to be all but inoperative

in inspiration, and the respiration be altogether thoracic. An enlarged liver will produce the same result as the amyloid liver of youth, and the cancerous liver of age. Or ascites may embarrass the diaphragm. Flatulent distension of the intestines is often a great source of distress to those afflicted with a weak heart, and especially when the right heart is severely taxed. Emphysematous patients often suffer much from flatulent distension interfering with the action of the diaphragm.

Cough.—A cough is an involuntary forced expiration; commonly excited by the presence of some irritant cause in the air-passages, which is removed by the cough. Sometimes one cough is enough for this end; sometimes a paroxysm of repeated coughs is necessary for its removal. Sometimes the irritant matter is removable by cough, sometimes not. When a crumb 'goes the wrong way,' cough is successful in getting rid of it. When a softening tubercular mass is the cause, then the cough is useless—until the softening has reached that point that the matter can be expectorated. Each is a foreign body, like 'the thorn of Van Helmont.' (The thorn (*l'épine*) of Van Helmont is an expression now almost forgotten. Trousseau uses it. A foreign body—that is, an abnormal substance, whether introduced from without or produced from within—is an irritant to the tissues around it, like 'a thorn' in the flesh.) Thus we get cough from a source of irritation in the air-passages, whether drawn in by inspiration, as smoke; or produced within, as bronchial mucus. A softening mass of tubercle excites cough; or fulness of the pulmonary vessels, as the 'heart-cough' of mitral valvulitis. The irritation may exist elsewhere. A 'stomach cough' is common in indigestion; a 'liver-cough' is not unknown: while the 'cradle cough' of pregnancy is familiar to all. An 'ear-cough' also is generally recognised. A dry cough is excited by worms, or by dentition, or some central brain affection. The cough excited by a long uvula has often been mistaken

for the cough of early phthisis. Children and young persons, mostly girls, are liable to a neurosal cough. Sometimes it is loud, even brazen, like the cough of an aneurysm pressing on the recurrent laryngeal nerve; more commonly it is the little 'hemming' cough of early phthisis. This last is at times almost incessant, and causes great alarm to the patient's friends. Then there is the cough of chill blood passing into the lungs, experienced on getting into a cold bed, so troublesome with elderly persons who have morbid changes in their respiratory organs, or their circulation. Also the cough of getting out of a warm bed on a cold morning. This usually dislodges some of the mucus which has gathered in the night, and repeated cough gets up a quantity of mucus often dark-coloured from carbon. This is usual in persons with some bronchial catarrh, and is spoken of as 'morning cough.' In disease of the larynx and trachea the cough is shrill or hoarse, or barking, while the 'croupy' cough of children is well known. The dry, irritant cough of the first stage of bronchitis, when the mucous membrane is tumid, contrasts with the moist cough of the second stage, when the secretion is free. A dry cough may indicate a thoracic or a non-thoracic cause. A moist cough is associated with conditions which are intra-thoracic, and which produce fluid in the air-passages, as bronchitis (where the moist cough succeeds the dry as the case moves on); secretion in bronchiectasis or cavities; oedema of the lung; the clearing up of pneumonia with grey expectoration; the florid sputum of earlier pneumonia; the prune-juice of broncho-pneumonia; the blood of vascular congestion, whether general (mitral) or local (in patches of consolidation).

The cough may be very exhausting at times, as in softening tubercle, the patient being bedewed with perspiration. It may be prolonged when the firm walls of a bronchial dilatation in a cavity resist the pressure requisite to expel their contents. It is very painful in cases where the pleura is inflamed. Sometimes it is most troublesome in the day,

at other times it is worst in the night, utterly preventing sleep in some cases, while dry 'hemming' or 'phthisacking' neurosal cough, especially in children, may go on in sleep, the rest being unbroken by it.

Hiccough.—This is a troublesome spasm of the diaphragm, frequently seen, and without significance. It lasts only a short time. But when it is due to gouty inflammation of the serous coverings of the diaphragm, it is persistent. As the trouble spreads, so the different organs are affected. When travelling over the stomach, there is vomiting; when extending over the abdominal surface of the diaphragm, 'hiccough' is excited. Persistent hiccough in advanced life has always been regarded as fraught with a grave prognosis. Its cause may be encephalic, and not diaphragmatic. In pericarditis the phrenic nerves, especially the right phrenic, may be so involved as to cause severe hiccough. In some cases this may extend to the length of paralysis of the diaphragm, with falling of the abdomen on inspiration. Hiccough differs from cough, in that it is an inspiratory, not an expiratory act.

Whooping Cough.—This is a cough *sui generis*. It is not connected so much with expiration as are other coughs, but rather with inspiration. 'The coughing-fit begins with a long-drawn, clear, piping sound (produced as the air is slowly drawn into the constricted glottis). Then follows a series of short, rapidly interrupted, expiratory coughs (the air, though vigorously expelled, being unable to force open the glottis for more than a moment at a time), and this is succeeded by the crowing, long-drawn, inspiratory act.' The 'whoop' tells that the paroxysm is over. Vomiting is a common result; even the contents of the bladder or bowels may be expelled, or prolapsus ani be produced. The face is blue with venous blood, and effusions of blood may follow, either outwardly or into the tissues. The child dreads the cough, and will cling to anything which will enable it to fix its shoulders to cough. After the true cough has passed

away, an imitative cough may remain, by the force of habit, for some considerable time.

Sneezing.—This is an expiratory act, which is not a cough. It is caused by irritation of the nasal filaments of the fifth pair. A cough clears the air-passages below the pharynx; a sneeze is directed at the nasal passages. In a sneeze the outgoing current of air sweeps those portions of the nasal cavities which lie out of the ordinary air-currents, and remove the offending matter—when so removable. In a cold affecting the nasal portion of the respiratory tract, sneezing is usual. At other times sneezing is rather a neurosis connected with nasal coryza, and may be very persistent.

Position.—The position assumed by a patient in reference to his breathing is highly instructive. He lies in that position which enables him to breathe most easily. Probably most people sleep on their right side rather than on their left; this is due to the liver, which is most out of the way of the diaphragm when the individual is on the right side. In some cases the patient can only sleep propped up, or sitting up in a chair, so that the contents of the abdomen may fall away from the diaphragm. This matter is closely linked with orthopnoea.

Another matter is this: the side which is undermost is comparatively at rest. Consequently the patient gets upon the diseased side in many cases; indeed, would suffocate, or feel as if being suffocated, if the sound side were undermost, and so acting little. In congestion of one lung the patient will keep on the affected side. When the congestion is passing away, he will be seen to turn over on the other side for a time at intervals. (This is a little matter not unworthy of being noted, as it will sometimes enable the observer to 'score.') The patient will seek ease indeed, each according to his own peculiarities. Speaking of pleurisy, Walshe says:

‘During the dry and plastic stages, the patient commonly

lies on the sound side or on the back. I have seen exceptional individuals lie by choice on the diseased side to control motion and stifle pain, as they assured me; generally speaking, this posture increases pain. After effusion has occurred, the patient lies on the back, on the affected side, or diagonally between both, with the head somewhat raised.'

He may lie on either side at first, according as ease is attained; but when there is effusion, he does not lie with the affected side uppermost. The upper lung is 'the working lung;' and if the working lung be compressed by an effusion, the breathing would be too embarrassed to be borne or tolerated. With the effusion, the patient turns on the affected side; and keeps so till absorption enables him to turn over on the other side without great discomfort. The existence of pleuritic adhesions will often cause a choice of position contrary to what would seem indicated. These are most commonly on the left side (left side pleurisy being much more frequent than right side pleurisy). Those adhesions limit motion in respiration, and with that friction, and its resultant suffering, and so put the part at comparative rest. Thus in a case of right side phthisis, the natural indication is to lie on that side; but if the movement of the left side of the thorax be hampered by old pleuritic adhesions, the patient may find it easier to sleep on the left side. When there are cavities or bronchiectases, it is a good practice to teach the patient to lie upon one side; after an hour or two the cavities of the upper lung having drained into the lower lung, the patient awakens; these cavities or pits are emptied by cough, after which the patient lies, and get some sound rest, upon the other side; or the patient may come to do this spontaneously. It is well to bear in mind the upper lung is the working lung, while the under-lung is at comparative rest in the horizontal position. Keeping this in view as a broad rule, the position a patient voluntarily assumes, under the direction of his sensations, is often highly instructive as regards his

malady ; that is, if the practitioner will only first carefully observe and then intelligently reflect.

The Voice.—This will often tell whether the patient be generally well or not. If loud and firm, the person is strong ; even if there be some local disease of grave character. Disease enfeebling the powers will tone down the voice. Some people, however, habitually speak in subdued accents. When seeing a patient in bed for the first time, the tone of the voice and the grip of the hand are often most suggestive, and give information of the highest value.

Then the voice may be affected by a cold ; and the voice of quincy, once noted, is almost unmistakable ever after. In affections involving the vocal cords, the voice is a whisper. Phthisis and syphilis are the two maladies which affect the vocal cords *par excellence*. Then 'aphonia' may be due to overstrain of the vocal cords in ardent songsters ; or it may be hysterical. Girls and young women often 'lose their voices' as a pure neurosis. Sometimes when asked to shout they succeed in speaking ; more frequently the result is a state of helpless bewilderment. Loss of voice is not uncommonly feigned, and the sudden infliction of pain, as a pin-prick when the impostor is off his or her guard, will usually elicit an articulate expression of pain. An aneurysm may produce it. Then the speech is affected by alcohol, by affections of the lips, a polypus in the nares, enlarged tonsils, and in the general paralysis of the insane, where the utterance is thick or 'clipped as in intoxication.'

CHAPTER V.

THE PULSE.

THE value of the pulse in diagnosis has always been recognised. The Arab and Moorish physicians understood its value fully; while the Chinese carry their views to a ridiculous extent, making the pulse of the two sides to have different significations; while the climax is reached by professing to be able to distinguish the sex of the foetus in utero by feeling the pulse of the mother.

Before the day of the clinical thermometer the pulse was carefully counted; and in many cases the watch will tell a great deal in as many seconds as the thermometer requires minutes. Indeed, in all acute disease, the pulse rate (and with that the character of the pulse) should be taken on each visit; if it gives suggestive information, this should be corroborated by the use of the thermometer—will often indeed be a guide to its use, or say it is not required. And because in very busy club practice the medical man has not the time to use his clinical thermometer, this is no reason for not using the watch; rather, to my mind, it is a very strong argument for the regular and systematic use of the watch in regard to the pulse. The introduction of the sphygmograph has lessened the respect once entertained for feeling the pulse; as if this last were to be laid aside like an obsolete instrument, or an antiquated practice. Nothing of the kind! The sphygmograph only writes, so as to record what the finger-tip feels. The tracing is the picture of the

pulse appealing to the eye, and capable of being preserved ; while the sensation of the pulse is confined to the brain of the observer. The sphygmograph has not introduced new terms in speaking of the pulse ; it found a nomenclature ready to hand. As to the ascent of the pulse, it has taught us little ; as to the descent, it has helped a great deal to clear our views. It has familiarised us with the 'form of the pulse,' an important matter for learning to understand it when felt ; further, it has taught us 'the line of ascent, corresponding to the ventricular systole ; the summit of this line, which represents the condition of the arterial system at the end of the systole ; and the line of descent, which corresponds to the flow of blood from the arteries to the veins during the diastole of the heart. It is with reference to the latter, more especially, that the sphygmograph affords important information not so well obtained by the tactile examination of the pulse' (Austin Flint). The sphygmograph should be used in the hospital as a part of a medical education, in order that the student may learn to understand the pulse, which must be felt in practice. About this there is a general agreement of opinion. 'In ordinary medical practice the sphygmograph has not as yet, and probably never will, come into general use,' says the great clinical authority just quoted. The practical utility of the sphygmograph for the great bulk of practitioners is, that it helps them to learn *how to feel the pulse*.

In the first place, always feel both radial pulses as an habitual practice. This will correct the judgment which might be formed from feeling one only. In early days, when an apprentice to my father, it fell to my lot one day to call on a pauper who, though out of sorts, was not seriously ill. To my dismay, on attempting to feel his pulse, none could be detected. On arriving at home, my report was faithfully made ; with the result that my father went to see him at once at considerable inconvenience. He found no pulse either at the wrist first taken, but at once

seized the other wrist. There was a very good pulse. On examining for the cause of this it was found there was a severe cut on the wrist which had led to an irregular blood-flow, and accordingly no pulse could be felt where a pulse ought to have been! The bantering which followed was a good lesson. Nevertheless, since aspiring to the position of a hospital physician another good lesson has been administered. A patient at the West London Hospital was shown to many visitors as a well-marked instance of aortic regurgitation. One day, on feeling both wrists, the absence of pulsation in the left radial told of an aortic aneurysm as well, in all probability. It was just as well for my reputation that this discovery was made by myself, and not by one of the numerous visitors.

It is well to feel both radial arteries habitually, as a not uncommon distribution for the artery is up the thumb. The *superficialis volæ* is usually a small branch, but at other times it forms the main trunk of the radial; and may be seen distinctly coursing over the carpal articulation of the thumb on its dorsal aspect.

In feeling the pulse there are many matters to be noted beyond its mere rapidity. Its character is quite as important as its rate. Its ratio to the respiration is also often very suggestive. Then there is also its rhythm. Its rapidity tells of the frequency of the heart's contractions. Its character may depend upon the condition of the arterial walls. The pulse depends (1) upon the ventricular systole; (2) upon the arterial wall; and (3) upon the state of the arterioles. This last is of importance in febrile conditions. Here the arterioles are relaxed, and so permit of the blood running freely out of the arterial system. The accelerator fibres of the *vagus* are thrown into action, and by more rapid action the heart pumps the blood into the unfilled arteries. The opposite condition is that of the arteriole contraction of granular kidneys; here the blood can only flow out of the arterial system slowly, the arterial

tension is high, the roots of the vagus are flooded with blood, and its inhibitory fibres are thrown into action ; with the consequence that the heart's contractions are slowed. Here there is a powerful slowly acting ventricle, and a tense pulse ; contrasting with the rapid slight stroke (to use a term applied to steam engines) of the heart in pyrexia, and the compressible pulse. The rapid pulse of the low arterial tension is the antithesis of the slow pulse of full arteries. This is the first cardinal or fundamental matter to be grasped ; the main division of the pulse to be kept in mind.

The Fast Pulse.—This may be due to nervousness ; and it is an excellent rule to take the pulse when the patient enters the room, or you enter the patient's room ; and if found fast, to wait till towards the end of the interview, and take it again. If then found much slower, it is clear the rapidity found in the first counting of it was simply nervousness. Then the pulse rate is heightened in fevers and in inflammations ; and this fact will often tell whether severe pain is inflammatory (when the pulse is quick), or neuralgic (when the pulse-rate is normal). Or the pulse may be rendered rapid by alcohol recently taken, or by long-past indulgence. The pulse is very rapid in conditions of dilatation of the left ventricle, when a little blood only is pumped at each systole from the overfull ventricle. The pulse, too, mounts up in rate when the right ventricle is being over-distended, and the patient is sinking from thoracic disease. In pulmonary affections rapidity of the pulse-rate is of bad omen. 'In chronic inflammations the frequency of the pulse is a guide in judging of the degree of constitutional disturbance, or the tolerance of them by the system. For example, in pneumonic phthisis, other things being equal, the disease may be said to be telling upon the powers of life in proportion as the pulse is persistently frequent. The symptom has an important bearing on the prognosis, and on the propriety of sending patients away from home ; the same is true of the chronic affections'

(Austin Flint). This last remark is well worth pondering over. As to the rapidity of the pulse in phthisis, a rapid pulse is always to be disliked. Some old practitioners make a forecast of consumption when the pulse is persistently over a hundred; even when no physical signs have manifested themselves, especially in cases where the family history is suggestive of phthisis. In one case seen a few months ago, a mitral stenosis was found with a very quick pulse, and an irregular temperature tending to rise. The patient was a girl previously healthy. She gradually sank without any apparently sufficient reason. Dr. Quain suspected some ulcerative endo-carditis.

The Slow Pulse.—The pulse is slow when there is a tight artery, and the hypertrophied heart of the granular kidney, variously spoken of as chronic Bright's disease, or 'the gouty heart,' according to the peculiarities of each case. Here there is a strong ventricle, a loud aortic second sound, a firm pulse, with the physiological associations of a large bulk of urine of low specific gravity. A very important association to be borne in mind in practice, as it will often furnish the clue to the right interpretation of anomalous or not very definite symptoms. Then again the pulse is slow, without power, in fatty degeneration of the heart; and when the indications of senile degeneration are presented with a slow pulse, the observer should be on the alert; no matter whether the pulse is a faithful index of the cardiac contractions, or whether a number of these contractions are too feeble to reach the radial pulse.

Then abnormal slowness is found as a normal condition in some persons; and a pyrexial state only gives a pulse of normal frequency. A pulse of forty, or even less, is not rare. This peculiarity may be found even as a family characteristic. Then great slowness is sometimes the effect of digitalis. A slow pulse is not uncommon in jaundice or cholœmia.

'The significance of slowness is the resistance offered by

arterial tension. By hæmorrhage, or the abstraction of blood, a slow pulse may be changed into one which is quick, and giving the sensation of increase of force, the change being due to diminution of arterial tension' (Austin Flint). Perhaps the most instructive lesson in this matter is taught by the effects of the inhalation of nitrite of amyl in cases of the tense slow pulse. In a few seconds, as the face flushes, the pulse changes; from the slow, incompressible, firm pulse, it is transformed into a rapid, compressible, febrile pulse, by the relaxation of the arterioles, caused by the action of the amyl nitrate. In a few minutes, as this effect passes off, the pulse regains its primitive character.

A slow pulse, too, may be found with encephalic disease, sometimes as a consequence of it.

Then there is 'quickness' or 'slowness' of the pulse, which is the impression given to the finger by the filling of the artery. There is the *pulsus celer*, of quick filling of a slack artery, giving the high ascent of a sphygmographic tracing, which contrasts with the short sloping ascent of the atheromatous artery. The slow pulse, *pulsus tardus*, is the opposite of the *pulsus celer*; its most typical association is that of aortic obstruction where the ventricle slowly empties itself into the arterial system.

The Slack Pulse.—This is the pulse of an unfilled artery, without special reference to its cause. The heart may be contracting feebly; the arterioles may be relaxed so as to allow the blood to run freely out of the arterial system; or the artery may be unfilled from deficiency of blood, as by hæmorrhage, or other drain; or from mal-assimilation. This pulse is easily obliterated by pressure betwixt the finger-tip and the osseous structures beneath the artery. This pulse goes with a small bulk of urine, *i.e.*, the urine of low arterial tension.

The Tight Pulse.—Here the pulse is tight, tense, or cord-like. It is the pulse of high arterial tension. It goes with a large bulk of urine, and is usually a slow pulse. In well-

marked cases of granular kidney the artery may feel, as Dickinson puts it, 'like a tendon.' Such a pulse is only compatible with a stout, powerful ventricle, and is the concomitant of hypertrophy.

In pyrexial states the blood passes into the opposite condition of a fast slack pulse; just as it can be made to do by the inhalation of nitrate of amyl.

The Hard Pulse.—This is sometimes the expression used for the 'tight' or 'incompressible' pulse. It should rather be reserved for the state of the arterial walls, than their contents. The atheromatous change is a hardening of the arterial wall, due to the full or 'tight' artery, otherwise to over-distension of the arteries. As the artery hardens, it may grow elongated and tortuous. It may be a small wiry vessel, as commonly seen in cirrhosis; or a thick-walled vessel, as seen in well-fed gouty persons. This atheromatous hardening exaggerates the pulse, and gives an erroneous impression at times of the vigour of the cardiac contractions. Then the arterial wall may be the seat of calcareous deposit, becoming almost as rigid as a clay tobacco-pipe stem. Such a state when well marked is unmistakable.

The Delayed Pulse.—The radial pulse sometimes lingers behind the ventricular contraction an undue time. It has been regarded as linked with aortic insufficiency, and Hayden has seen it in aneurysm of the aortic arch.

The Visible Pulse.—Sometimes the pulsations of the temporal artery and even the radial are visible, without disease being present. Most commonly the visible pulse is found with aortic regurgitation and a huge ventricle.

The Bounding Pulse.—This is the full, round, inflammatory pulse. It indicates vascular excitement with tone. It is the pulse of sthenic inflammation where our predecessors bled freely, and sometimes repeatedly. Certainly under venesection—I beg your pardon, my youthful reader, if you gave an involuntary start—such pulse changes its character, and markedly. Along with this the pain is usually relieved

in acute inflammations, as pleurisy for instance. There are many reflecting country doctors who take their lancet-case about with them regularly, at the present day; and make good use of the lancet too. In strong, plethoric country-people, in acute inflammation with the bounding pulse, which jerks up the finger at each systole, it is good practice to bleed. Such cases do not, as a rule, ever find their way into a large hospital. The change of the pulse under venesection or vascular depressants is a matter of high diagnostic value. In acute pleurisy, pneumonia, acute Bright's disease, meningitis, etc., such a pulse is found in strong adults. I have found it in a stalwart young man in commencing measles.

The Wiry Pulse.—Very curiously in acute inflammation of the abdominal viscera, and especially of the peritoneum, the pulse is not bounding, but small and wiry. The muscular coat is contracted, and the vessel feels small and hard, and in pronounced cases 'like a pulsatile wire.' The more rapid such a pulse, the worse the case. When the patient is sinking in peritonitis, the pulse mounts in frequency and becomes weak and irregular.

In hysteria the pulse is also small and hard; and in hysterical peritonitis the pulse is of little diagnostic importance. The large bulk of limpid urine which follows an hysterical attack tells of the high arterial tension of this hard small pulse.

The Dicrotic Pulse.—(*Pulsus Biferiens.*) This is a pulse which gives the impression of 'a feeble ventricular systole alternating with one of much greater strength.'—(Flint.) Hayden says, 'It is met with under the triple combination of abrupt and feeble contraction of the left ventricle, imperfect distension of the aorta, and diminished capillary resistance.' This pulse gives a very characteristic tracing.

Pulsus Paradoxus.—In many persons the rate of the pulse is considerably affected by the respiratory act; being slower during inspiration, and faster during expiration. This fact

is scarcely enough insisted upon at the present; and the old plan, to take the pulse during the whole minute, was a sound one, by which any possible source of error of this kind was eliminated. At least half the minute is desirable; a longer observation being made when indicated. The *Pulsus Paradoxus* is an exaggeration of this 'slowing' and 'lowering' of the pulse with every inspiration, which is rendered more pronounced by a forced inspiration. It indicates a labouring ventricle, usually with adherent pericardium (and pleura).

It is now time to consider the pulse in relation to disease of the heart itself. First it may be well to consider the modifications produced by valvular lesions; and, then, those connected with muscular changes, and the neurosal affections.

In Aortic Obstruction.—When the aortic orifice is narrowed, there is usually compensatory hypertrophy of the left ventricle, so that there is little modification of the pulse produced thereby; until the muscular wall yields under fatty degeneration. As long as the muscular fibre is sound, so long the rhythm is maintained, and the pulse has little about it of peculiarity. It may be said, speaking broadly, the pulse is hard, wiry, and incompressible. 'Hardness and force signify hypertrophy behind the narrowed orifice.'—(Walshe.) When the hypertrophy is yielding, then irregularity follows; as indicative of the state of the muscular walls, rather than the valve-changes.

In Aortic Regurgitation.—Here, however, the effect upon the pulse is very marked. The enlarged ventricle found with the valvular lesion causes a large amount of blood to be thrown into the arterial system on each systole, by which the arteries are abnormally distended. The recoil is very sharp, as the backward flow of the blood is no longer arrested at the aortic root. Consequently, this pulse has been described as giving the impression of 'balls of blood shot under the finger.' It has otherwise been termed

'collapsing,' or 'jerking,' or 'water hammer,' or again, 'Corrigan's' pulse. (From Sir Dominic Corrigan's 'Memoir on Aortic Regurgitation.') The peculiar character of this pulse is rendered more distinct, both to the finger and the eyes (by the sphygmograph), if the hand be held above the level of the head. Corrigan pointed out how this pulse is 'visible' in marked cases. Sibson has shown that the collapse might be heard by placing the patient's wrist to the ear.

When aortic regurgitation is complicated by stenosis, then this characteristic pulse is modified. When some stenosis is also present, this pulse is less pronounced. The same is the case where mitral regurgitation has followed in its turn, and Prof. Geo. Johnson, F.R.S., has demonstrated how this addition may be detected very readily by holding the hand above the patient's head. The mitral leak is then very perceptible in lessened distension of the artery on systole, and some irregularity in volume. When mitral stenosis is present, the characters of aortic regurgitation are toned down somewhat. When the muscular walls become the seat of fatty degeneration, then long halts may show themselves, and the more stenosis is mixed with the insufficiency, the more this is marked.

The 'steel-hammer' pulse is seen, or rather felt, in or near joints the subject of acute rheumatism in cases of aortic regurgitation. 'The pulse is abrupt and energetic, as the rebound of a smith's hammer from the anvil.'—(Hayden.) The pulsations of aortic regurgitation may often be felt as far as the anterior tibial, or seen in the retinal artery. In some cases the pulsation will be seen in the brachial artery, from close to the axilla down to the wrist, coming swiftly like a flash. Here the pulse is aptly termed 'locomotive,' and its instantaneous character is very distinct in the sudden distension, and the equally abrupt 'fall back.'

In Mitral Stenosis.—In consequence of the obstruction of

the blood-flow at the mitral orifice, the arterial current is feeble, and the pulse small. About this all authorities are agreed. It may, too, be rapid at times and in some cases. As to how far it is irregular opinions vary. George Balfour insists that it is irregular, and Dr. James Andrew agrees with him. On the other hand, in my experience there is no irregularity in mitral stenosis, and in this view Dr. Broadbent shares, always admitting irregularity in the final stages of mitral lesions. Dr. Walshe goes further, saying, 'And it must not be forgotten that mitral stenosis tends to equalize the irregular pulse of mitral insufficiency.' Flint says of the mitral lesions: 'The pulse is small in proportion to the amount of obstruction and the quantity of blood which regurgitates. After dilatation of the heart has taken place, the pulse is often weak, irregular, unequal.' Hayden wrote: 'The pulse of mitral obstruction is usually quite regular, and not above ninety in the minute, but small;' irregularity showing itself in the final stages, and with this view Dr. Sansom agrees. Thus the testimony is unanimous as to irregularity in the later stages; but views diametrically opposite obtain as to irregularity in the earlier stages.

In Mitral Regurgitation.—As to irregularity with this lesion no difference of opinion exists. The pulse is irregular alike in volume and in time: in volume, according to the amount of regurgitation through the mitral orifice at each systole; irregular in time (as well as volume) according to the vigour of each ventricular contraction. The irregularity in volume belongs then rather to the leak; irregularity in time, to the muscular failure. The irregularity in volume is often sufficient to tell of mitral insufficiency before the chest is examined. As compared to stenosis, insufficiency produces more pronounced effects upon the pulse; whether mitral or aortic.

In mitral lesions in 'the gouty heart' there are some points to be noticed. Here the valvulitis comes on after

a certain amount of hypertrophy has been long existent. Consequently there is the firm strong pulse of the gouty heart as the main characteristic; and upon this comes the effect of the lesion. The irregularity in mitral insufficiency usually speaks for itself; for irregularity is not part of well-fed hypertrophy. But in stenosis the case is different. The effect here is to diminish the vigour of the pulse; indeed, to cut away the characters of the pulse of the gouty heart, and bring the pulse nearer to that of the normal heart. Consequently nothing but physical examination will tell of this lesion; and it should never be forgotten when an elderly person, especially a male, complains of not being so equal to effort as of yore. Indeed, when the appearance is that of gout, and the artery is hard, it is well to listen for the ominous but very localised murmur—here most significant. Then come the relations of the pulse to the muscular walls of the heart.

In Hypertrophy.—Wherever there is hypertrophy there is a certain amount of vigour and tone in the pulse. It is full, firm, and incompressible. When the arterial wall is atheromatous, these characters are intensified. When there is aortic narrowing, then they are less pronounced. There are indeed the changes produced by hypertrophy, before the valve-lesion, to be calculated in 'the gouty heart,' whether aortic or mitral; as well as the subsequent hypertrophy, as in primary valvular lesions. And for this calculation individual thought, involving the capacity to think accurately, is essential. No amount of description will do the thinking for the reader; it must be done by himself and for himself.

In the Gouty Heart.—Here there is not only a firm pulse on systole, but the artery is full during diastole, in consequence of the contracted arterioles obstructing the blood-flow out of the arteries. It is essentially the 'full artery,' whether there be much atheroma in the arteries or not. Whatever the modification produced by accompanying

valvulitis, usually subsequent, though not always, this is the essential feature of the pulse in the gouty heart.

In Dilatation.—In dilatation the pulse lacks tone, as dilatation is caused by asthenia of the muscular fibre. Consequently, as women are more liable to conditions of asthenia from imperfect assimilation than men, dilatation of the heart-walls is more constantly found with women than with men; though of course common enough with the latter. Not only is there a lack of vigour generally, but the ventricular contractions are unequal, some being more complete than others. The result is the pulse of dilatation is irregular in volume. In simple dilatation the pulse is small, compressible, and irregular, as a small quantity of blood is pumped out at each stroke. When a mitral leak is the result of the dilatation, then the feebleness and irregularity in volume are accentuated; the pulse being a mere flutter, or 'a wobbling thread.'

Hypertrophy and dilatation are very commonly blended. Consequently the pulse possesses something of a mixed character. The vigorous stroke of hypertrophy is felt occasionally amidst the feeble pulsations of dilatation: when the hypertrophy is the smaller factor. When the dilatation is the lesser and hypertrophy the leading feature, then the feeble impulse is felt amidst a majority of vigorous strokes. Consequently when a dilated heart is gathering itself together under digitalis, the pulse tells of the improvement in the ventricular contractions, by a larger proportion of vigorous impulses. When, on the other hand, an hypertrophied heart is yielding under tissue degeneration, then the falter becomes more frequent, and the proportion of vigorous strokes less; and this is intensified by the effect of a slight effort. The halt in the rhythm followed by a stronger impulse tells of this condition; though there is a point, to be discussed further on, which separates this from the mere halt of a neurosal trick (p. 88). In dilatation

one or more feeble strokes precede the halt; while the neurosal halt is usually preceded by perfect rhythm.

There is a difference in the action of the heart according as there is yielding, or not, of the sound muscular fibres in the decaying heart. Where there is yielding of the sound fibres in a heart once hypertrophied, the pulse is that of hypertrophy-with-dilatation, viz., irregular in force, according as the sound fibre contracts vigorously or feebly.

In the Fatty Heart.—Hayden says: 'There is in all cases evidence of partial failure of the circulation under the form of weak irregular, intermittent, or very slow action of the heart and radial pulse,' recognising the distinction just made above. Da Costa speaks of 'a pulse permanently slow, or permanently frequent and irregular,' especially if there be evidences of senile changes in the arteries and elsewhere. Flint writes of its semeia—'One of these is infrequency of the pulse. Cases have been reported in which the pulsations were reduced to 30, 20, 15, and even 9 or 10 per minute. It is possible, if not presumable, that in some of these cases the pulse did not accurately represent the number of ventricular contractions; certain of these being too weak to cause an appreciable pulsation of the radial artery. However that may be, notable infrequency of the pulse occurs but rarely in connection with fatty degeneration, and it occurs as a symptom of a purely functional disorder. Its occurrence with fatty heart probably denotes only an associated neuro-pathic affection.' The fatty heart, as compared with the dilated heart, has a pulse slow, quiet, and feeble, with syncope on effort—an ominous quietude indeed; where dilatation is induced by structural decay, there is an irregular, tumbling, tossing heart with palpitation on effort. Often there is a blend of these two opposites, and then there is a pulse lacking in tone (in divers ways), with evidence of tissue-decay elsewhere.

And now something may be said of irregularity and intermittency, which may be linked with muscular failure,

or be pure neuroses—a discrimination of very considerable moment. Much avoidable misery has been entailed by confounding one with the other; assuming structural decay when there was only a neurosis present.

Irregularity.—As said before, irregularity is the associate of the dilated heart. When the muscular fibrillæ are stretched, the rhythm of the heart is disturbed. It has a tossing, tumbling action, which is increased when any effort is necessitated. Its essential feature is—some regular strokes, then two or three short imperfect strokes, a brief halt, and then a full contraction. This is the pulse of failing hypertrophy. It is well to familiarize the finger with this pulse, comparing it with the cardiac sounds. Or the irregularity may be imitated by tapping a table with the long finger with advantage. The short strokes before the pause distinguish it from the simple halt, common enough, which is a mere nervous trick. Yet this last is being constantly mistaken for the more ominous irregularity of a faltering heart-wall.

Then the pulse is irregular in exophthalmic goitre, corresponding to the tumultuous action of the heart; and the same is found along with chorea, especially in girls.

Then there is irregularity in the pulse of 'the irritable heart,' of which the marked feature is the increase of beats produced by standing up; which is greatly in excess of the normal increase, some five or ten beats, according to the individual. But in the irritable heart the increase is from twenty to thirty beats per minute on rising.

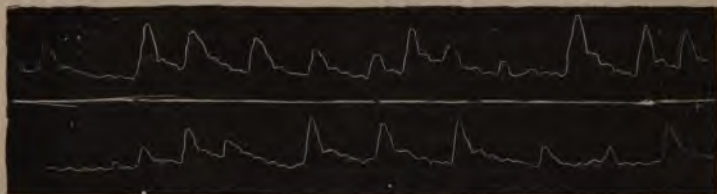
Then there is the irregular pulse of persons with congenitally small hearts, where the stroke is frequently lacking in power.

Then disturbance of rhythm may be due to some brain disease. 'In acute and chronic diseases of the base of the brain, the rhythm of the heart is often greatly changed, and this is probably due to irritation or paralysis of the cardio-inhibitory centre in the medulla.'—(James Ross.)

Intermittency.—This may occur with irregularity, or be a distinct affection. There are three forms.

1. The pure halt.
2. The halt with irregularity.
3. The halt with defective beats.

1. The pure halt. This is a pause occurring amidst regular equal strokes. It may be so frequent as to occur every eight or ten beats, or only be found once in seventy, or in one hundred strokes. It is a nervous trick without significance. It is quite common in men advanced in years, yet without evidences of any decay or degeneration in the heart. It may occur in younger men. Dr. B. W. Richardson, F.R.S., was the first to clear up cardiac intermittency



of nervous association. It may occur after emotion, as shipwreck, or the shock of hearing of the death of an intimate friend; or like causes of disturbance. In a case seen lately—a Canadian—the halt dated from severe exertion and excitement in a fire at his store. Sometimes it gradually passes away, more or less completely; or it may remain permanently.

2. The halt with irregularity. Here the especial feature of the case is the short strokes occurring rapidly immediately

in front of the halt; the halt being followed by a comparatively powerful beat. The preceding pulse-tracings show these two forms of intermittency very clearly.

In the first, the beats are all equal till the halt arrives. In the other, the small beats preceding the halt are distinctly to be seen.

3. The halt with defective beats. Here there is quite a different halt from the two preceding varieties. The ventricle contracts sometimes fairly well, at other times very imperfectly, so imperfectly that some pulse-waves do not reach the wrist at all; while others are nearly lost on the way. The following tracing is too regular in its defective beat to be typical.

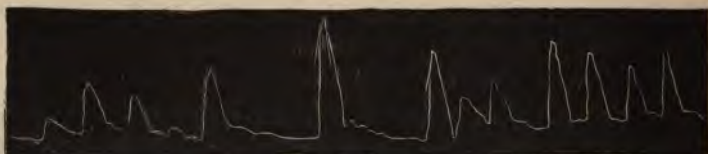


The full and the incomplete contraction of the ventricle is excellently shown, but they rarely occur so rhythmically, or so frequently, as in this tracing. This halt is common with fatty degeneration, and the disturbance is increased by any effort. In cold weather, old people with failing hearts will often manifest this form of intermittency, or it may follow a severe fever. In one case known to me, the heart's action, after a severe attack of typhoid, was terribly intermittent and defective. Long swoons were of frequent occurrence. Gradually and slowly it wore off to a great extent. Then the heart falters markedly when death is approaching, especially in thoracic affections. Here it is the right side which is failing. The following tracing tells of the intermittency of approaching dissolution. The heart is staggering and faltering, just as a wounded man staggers and falters before he finally drops.

Not only is it very desirable that the medical man be able to discriminate these different varieties of intermittency,

so as to differentiate one from another; but it is well to understand the import of the intermittency prognostically from day to day, as, for instance, the lessening thereof in recovery from acute disease; or the increase when the powers are failing.

There is, too, another point to be attended to, viz.: the relations of the radial pulse to failure of the right heart. The intermittency, with or without irregularity, is due to the left ventricle keeping time with the right. It is well to



compare the pulse with the heart's beats, listening to the latter while the finger is on the radial pulse. It will be found that the radial pulse is not quite so faithful an index of the ventricular contraction, when the right side of the heart is involved, as it is when it is the left ventricle which is affected.

Disturbed Rhythm in Digestion.—Then there are disturbances of the heart's rhythm, set up by the digestive act. There may be flatulence, and the pressure of the elastic gas upon the thin tendinous portion of the diaphragm embarrasses the action of the heart. At other times there is indigestion in fairly healthy persons, from unsuitable food; in others an ordinary meal will produce irregularity in the heart's action. Sometimes, instead of tumultuous action giving an irregular pulse, there is a simple halt. The patient may not be conscious of this in some cases; but in other cases the individual is acutely conscious of it, and may be alarmed thereat. It is held that the disturbance is brought about by an action through the vagus.

Arrested Action.—All are now familiar with the fact that

there are inhibitory fibres in 'that rope of mingled strands' the vagus nerve; when the roots of the vagus are flooded with blood, these fibres are thrown into action, and the heart is slowed. Sometimes irritation in some part of the body will act through these inhibitory fibres, and then the pulse is slow and feeble, like the pulse of fatty degeneration. The subjective sensations are those of incapacity to move, or even swooning. Indeed, swooning or fainting is usually arrest of the heart's action through the agency of these inhibitory fibres. Cases of arrested action are not sufficiently common to make all familiar with the affection. Yet it may occur in a very stalwart young person.

Accelerated Action.—Beyond the inhibitory fibres the vagus contains accelerator fibres. One emotion will act through the inhibitory fibres, producing a cold sweat or faint; another will act through the accelerator fibres, and cause the heart to beat rapidly and violently. Especially is this the case where there is also a blush, *i.e.*, dilatation of the terminal arterioles, with a low blood pressure in the arteries. This effect of a sudden fall in the blood pressure upon the heart's contractions, is readily seen after the inhalation of amyl. As well as emotional acceleration of the heart, there are cases where this rapidity of action will come on in paroxysms from other causes. Just as arrested action may occur at intervals in some cases; so in others the heart will suddenly beat with great rapidity, say from 160 to 200 per minute for a while, and then settle down to the ordinary rate. These conditions cause much alarm usually, because their interpretation is not understood or comprehended rightly.

Unequal Pulse.—When the pulse is unequal, the beat at one wrist being less forcible than that at the other, then there is usually an aneurysm involving the root of the subclavian artery. But any other pressure may produce this result; or the artery may have been more or less completely obliterated by injury, or by the growth of an atheromatous

patch at or near its origin. At other times it is part of a neurosis merely, and of no great significance.

Venous Pulsation.—Sometimes there is a venous pulse, when the capillaries admit of the arterial pulsation being continued into the veins. Usually, however, venous pulsation is connected with the condition of the right side of the heart. It does not necessarily follow that there shall be actual tricuspid regurgitation; though, of course, when that is the case the pulsation in the great venæ of the neck is very conspicuous. But at times the contraction of the right ventricle sends an impulse into the venæ cavæ in closing the tricuspid valves. But even if there be not actual insufficiency in the valve curtains, venous pulsation tells of right side dilatation. It may be that a pulse-wave may at times be due to the contraction of the muscular fibres in the coats of the venæ cavæ near the auricle.

Venous pulsation has only a limited range of relation, as compared to the arterial pulse, which has far-reaching associations.

Though the sphygmograph can never, in its present form, come into general use, the visible tracing is the permanent record of what the finger feels; or at least is the only known means by which the impression received by the finger can be made manifest to others. Consequently pulse-tracings have a high educational value, and should be studied as a means of educating the finger to feel correctly. This knowledge of the pulse was an important matter with the great men of the past, who gained that knowledge painfully and bit by bit. And acquaintance with the pulse must come back again; especially in the study of affections of the heart and the blood-vessels. The murmur is now the test of valvular diseases; but there are cases where no doubt can exist that there is a valvular lesion, and, further, what its nature is where no murmur is to be heard; while in other cases there exists a murmur often pronounced, without any reason to suspect organic disease. In the full belief, then,

that valvular lesions can be profitably studied from their physiological side, as well as from the side of physical examination, a series of sphygmographic tracings will now be given, to my mind of high educational value. They are selected by Dr. F. A. Mahomed, from his rich collection of tracings, with special reference to the title of this work : and the selection has been very judiciously made. The study of the series, contrasting one tracing with another, will do much to show the value of 'the physiological factor' in the study of disease in its clinical aspects. By the careful study of this series of tracings the practitioner will readily learn to grasp the information furnished by the finger ; for the finger is always at hand, and can be applied in a few seconds to gain the desired information—if the requisite knowledge exist in the cerebral centres with which the finger communicates. It is, then, in the expectation that the reader will so learn to educate his finger, rather than in any hope that the use of the sphygmograph can become general, that the following tracings are given.

In illustration of what is meant, it may somewhat surprise the youthful reader that in the *Lancet* for December 14th, 1833, the late Dr. Archibald Billing wrote a letter on 'Early Detection of Aneurysm in the Chest.' He found a resilient pulse in unmistakable cases, and from its study made his diagnosis in other cases. He says: 'When the resilience is slight, it requires some practice to feel it, and the fingers must be kept with a light elastic pressure on the artery at the wrist.' In the *Lancet* for March 8th, 1834, appears the following letter from him :

'Sir,—One of the patients alluded to in my letter of the 3rd of November last has since died, and upon *post-mortem* examination an aneurysm of the aorta was found, close to the heart, not larger than a common hen's egg. There was also hypertrophy and dilatation of the left ventricle. I believe this to be the smallest aneurysm of the aorta of which the existence has been detected during

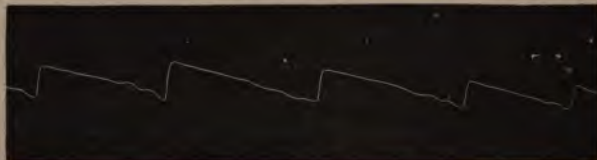
life ; at the same time I must observe that, in my opinion, the state of the left ventricle assisted the diagnosis.'

This shows what the education of the finger means far more forcibly, and eloquently, than any words of mine could do.

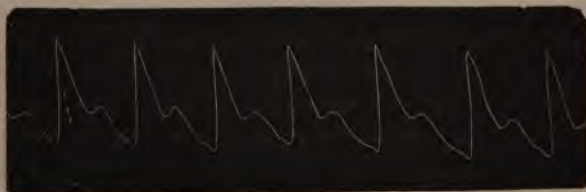
Further, the tracing of the pulse of high arterial tension is becoming increasingly valuable in the detection of granular kidney, where albuminuria is only fitfully present. Conversely the albuminuria of peptones does not necessarily involve any increased arterial tension. Also in less permanent conditions of blood surcharged with nitrogenised waste, the state of the artery is of inestimable value diagnostically, and therapeutically. Dr. Mahomed has also added several tracings showing the effects of treatment, of high significance in illustrating the action of remedial agents upon the circulation.

VARIETIES OF THE NORMAL PULSE.

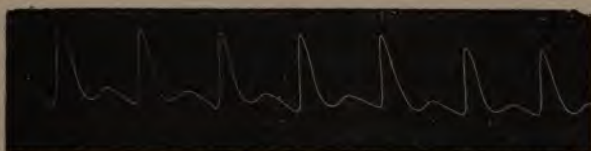
Showing varying degrees of arterial tone, *characteristic of the individual.*



A healthy man. Pressure, 3 ozs.



A healthy woman. Pressure, 2 ozs.

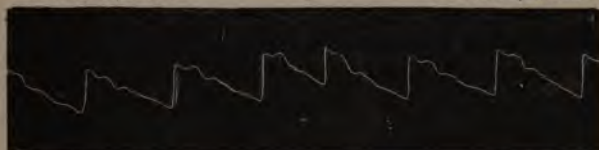


A hard-worked medical student, with diminished tone.
Pressure, 3 ozs.

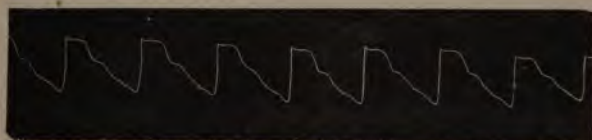
THE PULSE OF HIGH ARTERIAL PRESSURE.

Pressure, 6 ozs.

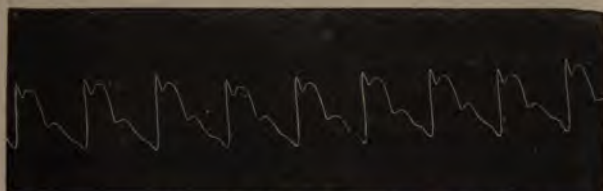
Pressure, 4 ozs.



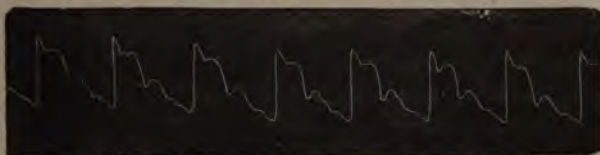
In an otherwise healthy woman, aged 27. (Functional stage of Chronic
Bright's disease.)



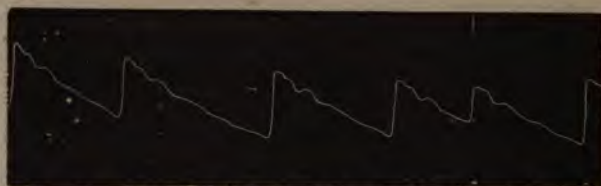
In a man, aged 68, without albuminuria. Pressure, $2\frac{1}{2}$ ozs.



In acute albuminuria after scarlet fever. Pressure, 5 ozs.

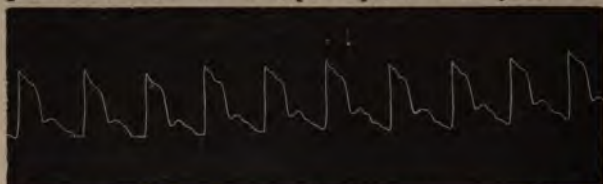


A man aged 30. Chronic Bright's disease, with dropsy for 2 years,
heart hypertrophied. Pressure, 6 ozs.



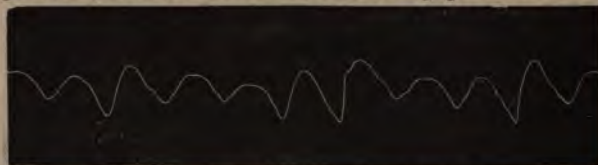
An aged man. Chronic Bright's disease, with dilated heart. Pressure, 7 ozs.

The pulse tracing of atheromatous vessels is practically that of high pressure, or of an hypertrophied heart; the collapse of the tidal wave is, perhaps, unusually sudden.



A man aged 45, with gangrene of the foot and extreme atheroma of his vessels. Pressure, 5 ozs.

The pulse in aneurysm often gives no indication, or only a slight one; sometimes the effect is very pronounced.

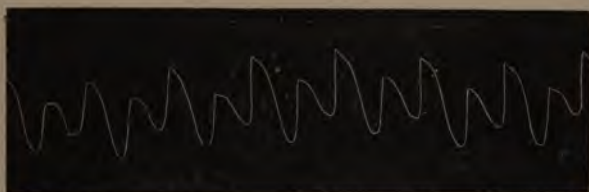


From a case of Aneurysm of the Innominate and Transverse Arches. Pressure, 1 oz. Right radial.

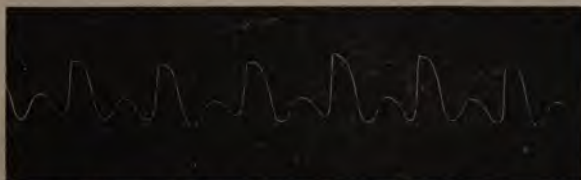
TRACINGS FROM ONE PATIENT, SHOWING VARIATIONS OCCURRING DURING A SEVERE ATTACK OF TYPHOID FEVER.



The worst form—an undulating hyperdicrotic pulse. Pressure, 4 ozs.



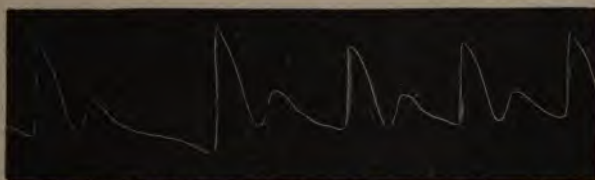
Heart gaining power, after free stimulation. Hyperdicrotic, but with good systole. Pressure, 3 ozs.



Recovering. Dicrotic, but no longer hyperdicrotic. Pressure, 2 ozs.

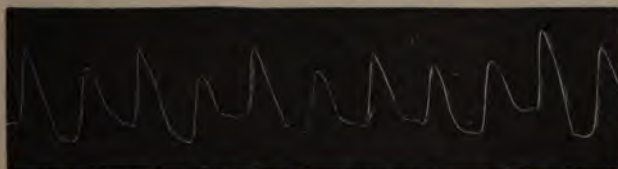


Convalescent, but heart laboured and enfeebled. Pressure, 7 ozs.

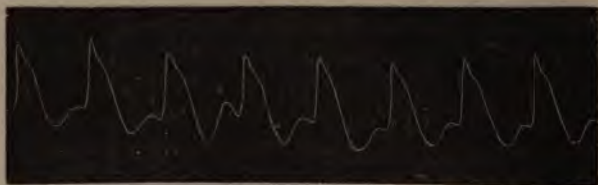


Digitalis given. Heart strengthened. Systole of good power. Pressure, 2 ozs.

VARIETIES OF PULSE IN SEVERE FEVER.



The mono-crotic pulse, often seen in severe pericarditis, which was present in this case. Pressure, 6 ozs.



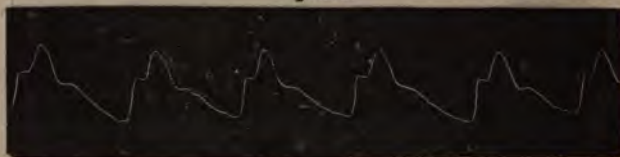
The hyperdicrotic pulse of severe pyrexia, without failing heart.
Pressure, 2 ozs.

FORMS OF PULSE ASSOCIATED WITH SEVERE AORTIC STENOSIS.

In some cases the pulse is not appreciably affected. Both of these cases show slow and laboured systole.



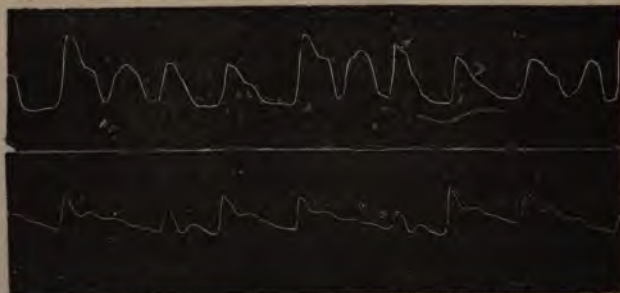
A man æt. 37, with phthisis and severe aortic stenosis. Pressure, $1\frac{1}{2}$ ozs.



A more rare form. Pressure, 3 ozs.

MITRAL STENOSIS.

The pulse is often perfectly normal in appearance, like that of mitral regurgitation, from which it cannot be distinguished.



Simultaneous heart and pulse trace, to show the 'pulsus biferiens,' i.e., the ineffectual contraction of the heart which does not open the Aortic valves. Pressure, 3 ozs.

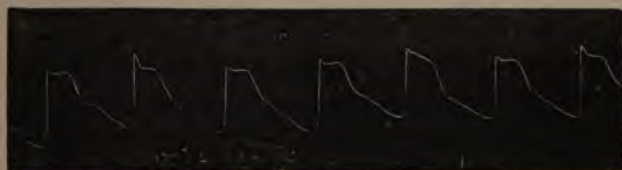


Mitral stenosis producing hyperdicrotism and rapid action of heart.
Pressure, 1 oz.



From the same case as the last, after taking Digitalis for 20 days.
Pressure, $1\frac{1}{2}$ ozs.

FORMS OF PULSE SEEN IN AORTIC REGURGITATION.



Woman, æt. 62. Aorta good. Free regurgitation. Simulates high arterial pressure. Pressure, 1 oz.

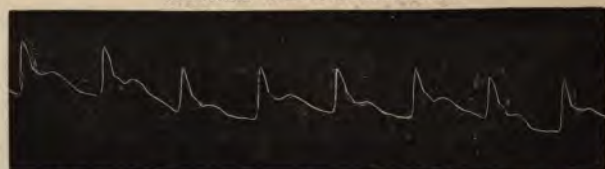


A typical 'splash' or 'water-hammer' pulse. Pressure, 2 ozs.



Aortic regurgitation under the influence of Digitalis. Violent systole.

MITRAL REGURGITATION.

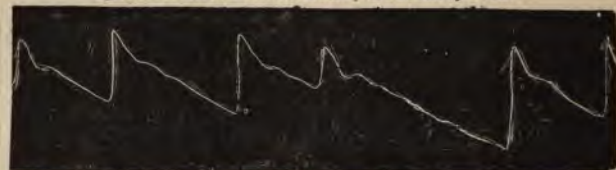


A boy, aged 10, with much dilatation and mitral regurgitation, showing the short, collapsing systole. Pressure, 1 oz.

EFFECT OF DIGITALIS.



The characteristic rapid, irregular, and failing heart of mitral regurgitation with dilatation. Pressure, 1 oz.



From the same case as the last, after taking Digitalis for 9 days. Pressure, 1 oz.

CHAPTER VI.

THE ALIMENTARY CANAL.

THIS gives a variety of indications, from the uncomfortable pharyngeal hawking of dyspepsia to the pruritus ani of seatworms or the worry of an external pile. The first act of importance is the modification of the act of swallowing, or dysphagia.

Dysphagia.—This may be due to an abscess behind the pharynx, to cedema of the epiglottis, or enlarged cervical glands. It is more commonly associated with aneurysm of the great vessels of the root of the neck, and with stricture of the œsophagus; or it may be a foreign body impacted in the gullet. In stricture in a young woman it will probably be hysterical; in an elderly man it is usually cancerous, though it may be a fibrous stricture brought on by swallowing soap-lees, for instance, or it may be neurosal. So far as is known to me, the characters of the act of swallowing in dysphagia have not been carefully studied. Usually there is only the capacity to get down small quantities at once in stricture or pressure. Some time ago, I was called far away to a case where there was dysphagia, with little else, only a patch of dulness at the back. Consequently, it became essential to study the act of swallowing carefully. A small quantity was certainly returned, while half a tumblerful of fluid could be gulped down successfully. The opinion given was, that there was partial paralysis of the gullet (corresponding to the area of dulness at the back), and that it was not stricture

nor pressure ; and the opinion was verified by the gradual disappearance of the dysphagia. Further observation of the act of swallowing would probably repay the trouble taken.

Vomiting.—This is due, not only to the contraction of the stomach itself, but of the diaphragm and abdominal muscles. It is said, in one case at least, of poisoning by a corrosive acid, a large piece of the stomach was vomited before the patient died. Vomiting may be due to three causes. It may be primary in the stomach ; reflex, as in renal calculus, or pregnancy ; or it may be cerebral. At other times the vomited matter is faecal, or urinous ; or it may be a part of a general disturbance. It is common at the outset of fever, or in choleraic diarrhoea ; this may be termed ‘symptomatic vomiting.’

‘Primary vomiting’ may be due, either to matters taken into the stomach, or to ideas associated with them, or to some condition of the stomach itself. With babies it is quite common to see vomiting from too liberal a supply of food, the excess merely being rejected and the remainder retained. With some people all shell-fish produce vomiting without any apparent explanatory reason. In other cases, some special article of food, ordinarily well-borne by others, is always productive of sickness. Nauseating articles will lead to vomiting. So will ‘nauseating’ ideas. Rats are readily eaten when prepared as rabbits, and enjoyed, I am told ; but the announcement of the real nature of the palatable viand swiftly produces free emesis.

Then, as to the condition of the stomach. Vomiting is common with all morbid conditions of it, as it procures physiological rest for the viscus. It may be set up by merely taking food into the stomach, as in gastric ulcer, and acute congestion from alcoholic indulgence. In the latter, there is ‘morning vomiting’ of frothy mucus and loathing of food (usually, too, a foul breath, a loaded tongue, and evidences of nervous unsteadiness—together with the un-

truthfulness of the drunkard—are found with it). Gastric catarrh is not always alcoholic, and the food may be returned covered with mucous slime. Here time must have elapsed for the mucous covering to be formed. Immediate vomiting is due, either to gastric ulcer, or congestion of the stomach, or some toxic irritant. In the latter case it is suddenly developed, and may readily pass away. In ulcer the opposite is the case, as it is a chronic affection. When the stomach is at rest and alkaline, then the ulcer does not make itself felt. But let food be taken, and then the gastric movements begin dragging on the base of the ulcer, and the acid gastric juice is poured out; and betwixt the two acute pain is produced. Vomiting by placing the stomach at rest, in both ways, anatomically and physiologically, at once gives relief. Consequently, it has a high diagnostic value, this sudden ease after vomiting is set up. In cancer of the stomach the pain is not so strictly related to the taking of food, nor so pronouncedly relieved by vomiting.

The matter vomited is often instructive. When it consists of fecal matter it tells of intus-susception above the ilio-cæcal valve, or of a perforating ulcer between the stomach and the transverse colon. There is 'stercoraceous' vomiting here. In some chronic renal conditions the vomited matter is distinctly urinous in odour; this is 'uræmic' vomiting. Sometimes bile is mixed with the vomit; it may be due to liver disorder, but bile is often thrown up when the act of vomiting is severe or prolonged. Blood is not uncommon, especially in yellow fever. The 'Black' vomit is a symptom of the worst prognostic omen. 'Coffee-ground' vomit may be due to a congestive outpouring, or to a minute hæmorrhage. Blood of high colour tells of an ulcer eroding a blood-vessel, or acute congestion. It may be a form of vicarious menstruation. Indeed, in females, it is well to see whether the hematemeses be rhythmic, coming on at intervals, corresponding to the catamenial

periods, especially if the menses be irregular. Pus may be vomited from an abscess, usually in the liver.

Vomiting may be due to cough. Great depression of the diaphragm with the action of the abdominal muscles in severe cough may lead to sickness.

'Reflex' vomiting is due to irritation elsewhere. A blow on the testes usually leads to nausea and vomiting. The pregnant uterus causes vomiting, especially in the morning, until it has escaped from the cavity of the pelvis into the abdomen, when the vomiting ceases. A tender ovary usually causes nausea with retching and vomiting; and the 'ovarian' vomiting is that form found in younger women, which is often persistent, producing great suffering, and which is often spoken of as 'inflammation of the stomach.' Unless its origin be remembered, it is most intractable to treatment. Then a calculus in the pelvis of the kidney is usually accompanied by vomiting, which is 'reflex, and which has a high diagnostic value. Inflammation of the peritoneum will give rise to vomiting, even when the gastric fold of this serous membrane is not the seat of the inflammatory process. Abdominal wounds often give rise to vomiting, as do loads in the bowels. This is 'sympathetic' vomiting, and is a variety of 'reflex' vomiting.

'Cerebral' vomiting is due to some morbid condition of the brain. Its leading characteristic is freedom from nausea or sickness. It comes on 'very suddenly without any previous sickness.'—Abercrombie. It may be set up when the patient raises the head from the pillow. 'Cerebral' vomiting is not much discussed in works on the brain and its diseases at present. Concussion of the brain sets up vomiting very frequently, and as a symptom thereof, sickness is suggestive. Sickness is somehow linked with hemicrania. Romberg says of cerebral vomiting, the horizontal position relieves it; there is no premonitory nausea; no retching, the contents of the stomach coming up quite easily; while there are usually constipation, irregular action

of the heart, with symptoms referable to the head. Sea-sickness has got to find its satisfactory explanation. Whether it is cerebral or not is unknown. Certainly the nausea linked with it points elsewhere. Vomiting is set up often by vertigo in many cases. 'Sea-sickness' is set up by the movements of the camel, the 'ship of the desert,' with some persons. Vomiting may be excited by a foreign body in the ear. Romberg gives a case where it was very severe from pressure on the vagus.

Nausea.—A feeling of nausea—that is, an inclination to be sick—is usually the precursor of vomiting (except when 'cerebral'); or it occurs without vomiting under lesser exciting causes. When the alimentary canal is disordered, nausea is a very common occurrence. It is accompanied by a loathing of food, or even of the idea of food at times; and is the means by which the digestive organs secure physiological rest for themselves when unequal to carrying on their function. It is also experienced in a great degree in those cases of ovarian and uterine trouble which give rise to vomiting. It will be spoken of again in Chapter VIII.; it is mentioned here mainly in relation to vomiting and loss of appetite, as a means of securing rest for the digestive organs.

Appetite.—This is the sensation of desire for food. It may be lost, or it may be inordinate and morbid.

What hunger and appetite depend upon is rather a matter of speculation still, than a portion of what has been determined. They are not convertible terms. The desire for food is 'appetite' as ordinarily spoken of; and when this sensation is acute, it is called 'hunger.' But a person may be compelled to fast until all appetite for food has passed away, and a sick headache has taken its place. This is specially liable to occur with those persons who require food at frequent intervals, and therefore with women. Some require food in small quantities and at frequent intervals; these are persons whose digestive organs will not bear much strain. Others there are, usually robust men with square abdomens, who do not care for food frequently, but who

like a good meal when they are about it. There is some analogy betwixt these two classes of beings and locomotives. One steam-engine, which is engaged in running short journeys, has a small tender, and can carry but a small amount of fuel, necessitating frequent replenishing. The luggage engines, and the express engines for long runs, have larger tenders carrying huge quantities of fuel, so as not to require refilling at short intervals. It is much the same with human beings. The capacity of the digestive organs is not exactly commensurate with the girth of the individual; but there is a general relation. Persons with capable digestive organs usually have a large abdomen—*i.e.*, a large tender. Consequently there is the ordinary 'appetite' of the individual to be borne in mind when inquiries as to its variations are being instituted. Unfortunately for many persons, their appetite remains good and even keen when the real demands of the system are comparatively small; and in consequence they suffer from repletion with biliousness, or from gout in its wake. This is well seen in long spells of wet weather, when persons are prohibited from taking their usual exercise. They are confined to the house, yet the appetite remains unimpaired; and then some consequence of this repletion follows. One gets an attack of acute gout; another has the tense artery of lithiasis; while a third has a yellow shade on the tongue, and is bilious. These various conditions were very prevalent in the long rains of the past winter (1882-83). When a person much indoors goes for a walking tour, or even goes to the seaside, and is out much in the air, then increased oxidation leads to a whetting of the appetite. It is like a fire that is burning feebly, because partially choked with its own ash; give it a poke, and stir away the accumulation of ash, and then the fire burns up. The physiological relations of appetite must be borne in mind in the inquiries made. The appetite may be good, indifferent, capricious, dainty, or lost (anorexia); or be excessive (bulimia).

Persons vary much. One 'can eat anything that comes in his way.' If the appetite for food be there, it matters little what that food is, whether appetizing or not. Others, again, like the gazelle, are 'dainty feeders;' their food must be nicely dressed and neatly served up, or they revolt at it. It is also well in such cases that the food be offered in small quantities only; large quantities of food take away their appetite ('outface' them, to use a north-country expression). When ill or out of sorts, this daintiness of the appetite becomes very marked. The dainty child (not necessarily 'a spoiled child') stood a poor chance in the old days, when food was both coarser and less neatly prepared than now. The multiparous mother looks on her numerous brood at breakfast, her eye watching the efforts of each with delight in proportion to its capacity, and encourages them all 'to work away,' as if they were dutifully discharging a task. During the period of growth, when the demands of the tissues are great, the appetite is vigorous, except when there is 'acute growth,' and then the appetite is lost in the general malaise. So after a fever or other acute disease, the prowess of the individual as a 'trencherman' is often surprising.

In illness, the appetite becomes a matter of much importance. If the patient can eat, then the outlook is bright; if the appetite falls off, so the prospect darkens. In illness, and especially acute disease, the daily fluctuations of the appetite are eagerly watched. There is one point about the appetite in early phthisis which is not generally known, yet it is interesting. Loss of appetite is often a symptom, and an evil symptom, especially where there is a drain upon the system, as severe night-sweats; for between the two the patient falls away, with the risk of softening in the consolidated lung-apex ('becoming tuberculous,' as Niemeyer puts it). Here experience has told me that the arrest of the hydrosis is followed by a return of the appetite in a few days. It would seem that when the blood-salts are drained

away in sweat ('the phosphates, the chlorides, and the sulphates of the alkalies'), the appetite goes with them. Check the night-sweats, say by full doses of atropia, and with them this drain, and the appetite quickly returns. The appetite (with the pulse and the sleep) has to be carefully watched in acute disease, as telling how the patient is, which is diagnosis surely, if not diagnosis of the nature of the disease.

Appetite is linked with the emotions. When all is well, it is keen. Good news whets the appetite, and inclines the hearer to give a feast. Bad news palsies the appetite.

'Read o'er this,
And after this ; and then to breakfast with
What appetite you have,'

said King Henry to Wolsey ; and the prospect of eating lost its charms, we may be sure. In the same way, mere persisting mental emotion will destroy the appetite, just as it robs the individual of sleep. Some little time ago a case of anorexia with vomiting, especially at the times when the catamenia (which had disappeared) should have showed themselves, came under my notice in a young girl who had been disappointed in love. When the appetite is lost without obvious reason, it is well to apprehend some mental cause.

Hunger.—Hunger is a more pronounced condition of the normal appetite. 'As hungry as a hunter' tells of the effect of long severe exertion and fasting upon the appetite. Such is the effect of exertion with increased oxidation. The gourmand seeks an appetite by design, and resorts to toil, the great appetiser. Just as a good meal causes a pleasant psychical attitude—as the establishment of dinners for charitable institutions testifies—so fasting is linked with shortness of temper. 'A hungry man is an angry man' is an old saying, and hunger is readily transformed into anger. 'Hunger is the mother of impatience and anger,' said Zimmerman—an axiom it is well to bear in mind ; for the medical man, of all men, should be a student of human

nature. With women it is changed into a headache with irritability. Appetite to the invalid and the ailing is what hunger is to the robust—an unusual and pleasant craving for food.

Anorexia.—This is loss of appetite more or less complete. It occurs in the onset of fevers and inflammatory conditions, and is present in many less acute conditions. Anorexia is common with different forms of mental aberration; in some cases, indeed, when the real necessity for food is great and imperious. It is also common with what are termed 'hysterical' affections. It is also found in chronic conditions, as pernicious anæmia. It is seen in some cases of pulmonary phthisis, and has a malign influence upon the nutrition of the diseased portion of lung. It is also found in some 'cases of fatal disease occurring in persons of middle or advanced life, the pathological character of which is not as yet fully established, but which is probably seated in the glands secreting the gastric and intestinal digestive fluids.'—Flint. The recovery of the appetite is the evidence of convalescence setting in after acute disease. When the appetite suddenly disappears in convalescence, it is probable the patient has had too much food (a 'surfeit'), or it has been of improper or satiating character. After a day or two of fasting the appetite returns.

Anorexia is a phenomenon worth studying. The impression is general that the loss of appetite is an unmixed evil, and consequently the demand for an appetiser is prompt and unhesitating. This is irrational, and often unwise. The loss of appetite is nature's treatment in certain cases. For instance, the liver is upset, and the appetite disappears. Here the loss of appetite permits of the embarrassed organ recovering its lost functional activity. By such means, indeed, the liver secures physiological rest. It cannot get relief any other way. The stomach can get rest by vomiting, the bowels by the ejection of their contents in free evacuations, but the liver has no such ready means of obtaining

relief when embarrassed. So the outcome of a loaded or deranged liver is loss of appetite, which is not to be looked upon as a pure evil to be fought with by bitters. The simplest instance of liver-anorexia is the loss of appetite after a surfeit, whether in child or adult. The liver is choked with sugar and albuminoids, and requires time to deal with them. More food will only add to the embarrassment of the viscus, so the outer danger signal is hoisted, to use a railway term. The signal is up against more food. To attempt to force the appetite in such a case is as irrational as would be the conduct of an engine-driver if he ran past a signal standing against him. An avoidable accident is highly probable as much in one case as the other.

Anorexia, then, may be truly physiological, and not pathological at all.

Bulimia.—The opposite condition of bulimia is scarcely unphysiological when the demand for food is great, *i.e.* when the tissues are hungry. Here the needs of the system speak, or find expression in a craving appetite to supply the food the body requires. Convalescence from acute disease, which has led to wasting, and growth entail bulimia as their voice—their cry for food. But under other circumstances bulimia is a disease. It is set up commonly by some morbid condition of the mucous lining of the alimentary canal, intensifying the normal hunger, or appetite. It is not uncommon after measles, or other ailments of childhood; and is seen in some cases of advanced phthisis. More food is taken than can be digested; the blood is ill-fed; the craving increases; and if the false appetite is complied with, the patient soon sinks.

Perverted appetite is of lesser and greater proportions in various cases. It is seen in pregnant women who crave after all sorts of odd things. In hysterical girls who hanker after slate pencils, chalk, or coals. It is seen in the desire for condiments, for vinegar or salt, in dyspeptics who should

avoid such things. In insanity, sometimes, the most loathsome matters are eaten freely. A 'craving' appetite is sometimes seen to precede an acute attack of gout. In some epileptics it is the forerunner of a fit; and if it can be checked, the fit may be averted.

Dyspepsia.—The outlying symptoms of dyspepsia are legion, and cannot be discussed here. The essential features only can be given. Dyspepsia is 'difficult digestion,' known commonly as 'indigestion.' To comprehend dyspepsia it is well to think of 'the digestive act,' and its various steps.

Digestion is disintegration and solution. Starch is converted into grape sugar; proteids (insoluble albuminoids) into peptones (soluble albuminoids). Food must be made soluble to pass out of the alimentary canal into the portal vein. Having reached the blood, these materials would escape at the kidneys (as they do in some forms of albuminuria and glycosuria) unless once more made insoluble. So they are turned back into glycogen (animal starch) and into proteids. The first is the fuel of the body, the latter the nutriment of the tissues. Fat undergoes no change beyond emulsification into very fine particles, so as to be able to enter the mouths of the lacteals.

Now the first act, or solution in the alimentary canal, is 'primary digestion.' When it is imperfectly performed two main symptoms are manifested, viz., pain and distension. The late Arthur Leared thought pain indicated deficiency of gastric juice (and the relief from pain often given by a dose of pepsin corroborates this view); while distension, he held, was the evidence of imperfect muscular action in the stomach.

The pain is felt in the stomach itself, sometimes referred to the mid-sternum. Or, in women, chiefly, it is felt in the back 'betwixt the shoulder blades,' they will tell you. It is more or less acute; and is either free from, or complicated with a sense of distension. Sometimes it is set up immediately; while, at other times, it comes on at a later period.

When the discomfort is not felt for an hour and a half or two hours after a meal, then it is held to be 'duodenal,' because the time corresponds with the passing of the contents of the stomach into the duodenum. It may, however, point to cancer of the pyloric ring.

Sense of distension, or flatulence, is linked with defective muscular action. It may be experienced in the stomach soon after food is taken; or, later on, in the intestines. In gastric catarrh, especially when due to the venous fulness of an injured or failing heart, this sense of distension is ever present, in fasting as well as after food. Sometimes the mucous membrane gives off gas very freely. The rolling of the intestines (borborygmus) is audible, or the flatus comes up the gullet in roar after roar, in some cases so loud and so long continued as to be surprising. Or the flatus may pass *per anum*. The 'bowels yearn' indeed in some persons with emotion. And the ancient Hebrews (the most dyspeptic race upon earth) seem to have been especially liable to straining of the bowels upon emotion. 'The muscular walls of the alimentary canal seem frequently to be excited to increased action by agitating emotions; but it may be doubted how far this is a primary effect of the mental state, or how far it is consequent upon the influence of that state upon the secretions poured into the canal.'—Carpenter. Pain and distension are the two great indices of 'primary indigestion.'

'Secondary digestion' is applied to the further elaboration of the albuminoids (mainly) in the liver. From the albuminoids furnished to the portal vein the liver elaborates the serum-albumen of the liquor sanguinis, the pabulum of the tissues. The excess (or luxus consumption) or the imperfect products of digestion are broken up into bile acids (glycocholic and taurocholic), both of which contain nitrogen, while one (taurocholic) contains sulphur. Or they are sent on a retrograde metamorphosis through the series tyrosin, leucin, creatine, and creatinine, the early forms, to uric acid

and urea, the advanced forms of waste. Urea is the main constituent of a fluid urine. The solid urine of birds and reptiles consists on the other hand of urates. In human beings the liver sometimes makes urates freely, and the condition is known as lithiasis. When the liver drives an excess of proteids into bile acids, then the condition of cholæmia, or biliousness is produced. Sometimes this is due to an excess of proteids beyond the requirements of the body; at other times the tissues waste, the person loses weight while there is cholæmia, when the liver does not elaborate the proteids into serum-albumen; but drives them all downwards into bile acids or urine products. (The young pathologist may smile here, or even break out into derisive laughter! but the practice of physic is not confined to histological research. When he can put up 'a liver-cell wasted by care,' or 'liver-cell of cholæmia,' perhaps these conditions may dawn upon him. Or, possibly, when he begins to see a little of private practice, he may recognise conditions which do not provide him with material for his microscopic studies; and begin to find out that 'physiology' is not mere 'histology,' though it has been too long the practice to confound the two: making the latter synonymous with the former. A man may be a skilful histologist and familiar with embryology, and yet, not be a sound physiologist, let alone a safe physician.)

Or, in other cases, a tremendous output of white urates marks the later hours of the digestive act. Here, also, there is imperfect tissue-nutrition. There are no local symptoms of this, unless it be irritation of the urinary passages. But both in cholæmia and in the form of lithiasis, as well as in mere chronic forms of lithiasis or gout, these are evidences of the system being under a toxic influence. Especially does the nervous system suffer. Headache, vertigo, anomalous pains, a sense of ill-being (instead of the well-being felt normally after food), disturbance of the posterior cerebral lobes in morbid sensations, are manifested. There is

always panphobia, an impression of impending evil, no matter what the especial ailment. The action of the heart is commonly disturbed, and there may be palpitation (common with lithæmia), or depression of the heart's action (the common associate of cholæmia).

Such then are the local and general semeia of dyspepsia or indigestion.

Vertigo.—Vertigo, 'dizziness,' or 'swimming in the head,' is a symptom frequently met with in indigestion. It tells that the pons, or the cerebellum is disordered. Still, 'gastric vertigo' is not common, when we reflect how infinite are gastric disturbances. 'Disordered stomachs and feeble, weary brains would seem to afford the most favourable conditions for the generation of this neurosis, yet they do not seem *per se* sufficient.'—Handfield Jones. It comes on after a meal, and is usually relieved by emptying the stomach (vomiting); though sometimes its duration is more persistent.

Pyrosis.—Pyrosis, or 'water-brash,' is the eructation of an acid fluid from the stomach. It is not 'heartburn,' though there may be 'heartburn' present as well in some cases. There is a recurrent regurgitation of a fluid which scalds the gullet, and even the fauces. It is sometimes due to the formation of a fatty acid of irritant properties, as butyric or allied acid. At other times the fluid is alkaline. Fluid is here eructated without food. When the food is regurgitated, as in the ruminants, it is rather pleasant to the taste than otherwise. Such rumination is a peculiarity, not a disease.

The next matter to attract our attention is the intestinal canal, with its disturbances, of which the first is colic.

Colic.—Colic, or 'gripes,' is due to a spasm of the muscular wall of the intestines, producing acute pain, with or without flatulence. It is, indeed, a 'cramp.' Sometimes it is mainly gastric, when set up by improper food, as greens, especially when taken cold. It may be excited by some

irritant, as certain cathartic drugs. The pain may double the patient up, and the arms are pressed over the seat of suffering, and tightly, too. In peritonitis, the patient is at rest with his knees up, and the respiration almost entirely thoracic, so as to limit movement in the inflamed serous membranes; while in colic, pressure is grateful. There may be no desire to empty the bowels; but in other cases there is tenesmus. 'It is only the last rapid terminal undulations which are manifested by a frequent desire to evacuate the rectum.'

Colic, or griping, is often the result of a dose of purgative medicine. Some people cannot take any laxative without such spasm of the intestine being set up. Frequently the pain is due to abortive attempts to empty the gut. When the bowel can send on its contents, less pain is the result. When, then, the patient complains of much griping, this may be due to imperfect action of the bowels, rather than to excessive catharsis. It may be necessary to increase the dose of laxative; not to decrease it. Some patients suffer so much spasm when the vermicular action of the bowel is excited, that a sedative with the purgative is indicated.

Severe local pain may point to an ileus in the small intestine; or to a twist of the colon; to stricture, spasmodic or organic; or to a hernia. The peculiarity of intestinal pain is that it is referred to the umbilicus; just as the pain of the spinal meninges, being inflamed, gives the impression of a tight cord round the body ('girdle pains'). The reference of the pain to the navel is a valuable guide as to what to look for.

Lead colic is a severe affection, which carries with it the 'lead-line on the gums' as its most trustworthy evidence.

Gastralgia is a recurrent neuralgic state. Here the recurrent pain is referred to the stomach. At other times the pain is in the bowel. Like neuralgic affections, it is likely to be 'unilateral.' The superior mesenteric plexus and its ramifications are its seat. Handfield Jones relates of a

case: 'At 4 a.m. she was attacked with severe pain in the left lower part of the abdomen. This did not last an hour; but the next night it returned nearly at the same time, and was exceedingly severe for many hours. The pain spread about a good deal, and made her feel very faint. After it had gone off, there was no tenderness or uneasiness at all, nor anything abnormal in the abdomen, which was lax and soft.'

Tenesmus.—This is the feeling or wish to go to stool, excited by the presence of any substance in the sensitive lower portion of the rectum. Piles will excite it; so may a polypus in the rectum. Sometimes it is due to a hard fecal mass in the lower bowel. Then the feeling is persistent, because unrelieved by the act of defæcation. Fluid motions alone can pass, and consequently there is apparent diarrhoea. Persisting tenesmus, unrelieved by going to stool, should at once put the practitioner on the alert. Tenesmus may be set up by diarrhoea; and is one of the greatest causes of suffering in dysentery.

It may be confounded with 'rectal neuralgia.' Mr. Ashton describes such a case: 'He complained of great pain at the fundament occurring daily, and continuing for some hours, not induced or aggravated by defæcation.' Here the recurrent character of the pain tells of its nature.

Pain on Defæcation.—This may be due to fissure of the anus, or to spasm, or an inflammatory condition of the bowel, or an abscess in or near it. In women it is often due to a tender ovary, or the uterus may be at fault. A foreign body in the rectum may be the cause.

Pruritus Ani.—Itching at the seat may be due to seat-worms; or it may be due to some modifications of the contents of the bowel. When not due to seat-worms it is commonly an indication of a disordered liver. It may have other local causes than 'thread worms,' as eczema.

The periodical emptying of the bowels is essential to health. The interval which occurs betwixt each act of defæcation

varies with different persons. Two or three times per diem does not constitute 'diarrhoea' with some persons; nor an action once a week 'constipation' in others. When the action is at long intervals—and an action once a week would constitute positive relaxation of the bowels with some few persons—the term 'obstipation' is used. With most persons the bowels move once daily; with others, twice. An evacuation at night, as well as in the morning, is desirable if there be any source of trouble in the pelvis. The terms used for the action of the bowels are 'regular,' 'irregular,' 'constipated,' or 'relaxed.'

Regular.—This term is used when the bowels move at regular intervals, and the lower bowel is kept free from any load, or accumulation. It is well to ascertain what is the usual interval with each patient. 'Regular' is an elastic term covering many variations, if accepted from the patient without correction; and is not used with any attempt at precision by many patients, especially among women of the lower classes.

Irregular.—This term is also used with varying meaning in different cases. Usually it means more or less constipation. Not unfrequently it is used where the bowels are locked up for several days, and then are relieved by purgation (spontaneous).

Constipation.—This is a lethargic state of the bowels in which they are not sufficiently emptied. It differs from 'costiveness,' where there are scanty faeces. Sometimes the faeces get into the pouches of the colon and are passed in rounded masses like the faeces of several animals (*scybalæ*).

When constipation is present, whether with indigestion or any other malady, relief can never be effectually given until the bowels are educated to act properly. First, there is the load mechanically interfering by pressure upon the viscera, or obstructing the descent of the diaphragm; consequently, in *emphysema* the state of the bowels has much to do with the comfort or discomfort of the individual.

Or gases or offensive matters may be reabsorbed from the bowel. A form of anæmia is recognised at the London Hospital as being due to constipation, the offending matters absorbed from the gut destroying the red blood-corpuscles. It is sound practice always to regulate the action of the bowels: no matter what the malady complained of by the patient. This can always be done by perseverance on the part of the doctor and the patient, both. Many cases go on unrelieved, or but imperfectly relieved, because the medical man is careless, or timid, or does not grapple with the case effectively; while in other cases the patient is at fault, either failing to carry out the orders given, or tiring of the treatment. The bulk of cases of confirmed constipation are due to one or other of these causes, or, perhaps, sometimes to both combined. In girls the bowels are often allowed to go on unrelieved until a permanent evil has resulted, as dislocation of the ovaries, with adhesions forming so as to detain the misplaced ovary, giving rise to an after-lifetime of trouble; or the uterus suffers. The regular action of the bowels is essential to health. The bowels, too, may act well in health and be deranged by some malady, as anæmia, for instance, or some inflammation.

Flatulence.—This is very troublesome often. It may be a persistent matter, as in atonic conditions of the bowels; or it may only be found after a meal consisting of hot fluids, as is common with women after tea. 'I believe it is considered by some of our best authorities as highly heretical to hold that mucous membranes can secrete gas.'—Handfield Jones. Yet, as he points out, there are cases where there are 'bursts of gastric or intestinal flatulence. It seems as if one might almost speak of a gaseous diarrhoea.' Certainly, all intestinal gas does not seem to arise from the contents of the bowels, though probably the offensive gases do. Flatulence as a 'neurosis' is a clinical fact. In some thoracic affections, flatulence, interfering with the descent of the diaphragm, or even pushing it up, is a great

source of suffering. When flatulence is in the small intestine, it is apt to give rise to rumbling, as a contraction of the bowels moves the gas (borborygmus); and with some females this is very audible to others as well as the individual.

Relaxed.—Here the contents of the bowels are passed in a fluid state. This may be due to the activity of the bowel passing on the food so quickly that the fluid portion cannot be absorbed; or to excessive secretion of the intestinal glands: or both. Lientery is the term used when the food is passed per anum shortly after being swallowed, and practically unchanged by the digestive act; and is an instance of the first. The diarrhœa of copious watery stools is probably the latter, chiefly at least.

The character of the stools should be examined whenever there is any question as to the nature of the diarrhœa.

Diarrhœa.—This hyper-activity of the bowel may have various associations.

It may be due to irritant matter in the bowel, setting up excessive secretion with increased vermicular action for its removal. Here it is a physiological diarrhœa. (This is the form of diarrhœa 'cured' by castor-oil.)

It may be a catarrh from cold. If of the lower bowel, mucus will be present.

Or it may be compensatory to arrested renal action, the fluid having an urinous odour. Such diarrhœa is not uncommon with the subjects of old-standing renal disease.

In dysentery there are flakes of the exfoliated mucous membrane, telling of the mucous inflammation present.

Or it may be due to ulceration of the bowel, which may be tubercular.

The Stools.—The stools may be 'fatty,' when there is disease involving the head of the pancreas, and the fat is not emulsionized. With some phthisical patients their cod-liver oil passes *en masse*, unchanged by any digestion.

They contain mucus in muco-enteritis. They may con-

tain pus when an abscess bursts into the bowels as a liver-abscess.

Or the food may appear unacted upon when there is an ulcer betwixt the stomach and the transverse colon.

The stools are dark and offensive in certain bilious derangements; even dark and tarry when old secretion from the liver is passed; at least, so old practitioners talk and think, perhaps not unwisely!

Or they may be pale, as in the white stools of jaundice, indicating lack of bile. 'The white-scur' is a diarrhoea of children in hot climates, where the bile is deficient. In some forms of diarrhoea, and notably in typhoid fever, the stools contain milk curd. (When this is the case, it is well to stir some farinaceous matter into the milk to prevent its too firm curdling. Or some chalk in cases of diarrhoea which is not typhoid.)

In typhoid fever, the stools resemble pea soup, and are very offensive. Indeed, the character of the motion often plays an important part in the diagnosis.

In children, the stools are apt to be clay-coloured in hydrocephalus, or 'green as grass,' though this last colour is not due always to hydrocephalus; but may follow a dose of calomel. Grass-green stools usually go with malnutrition.

Then the stools may be blackened by iron taken as medicine; especially when the iron is not well-absorbed. Such stools often cause needless alarm.

The stools of meat-eaters are usually more offensive than those of vegetarians; just as are those of the carnivora as compared to the herbivora. A farinaceous dietary with milk will usually give light-coloured, and comparatively inoffensive, or odourless stools.

Small scanty fluid stools are alone possible when there is a mass, whether fæcal, or piles, or an ovary, or even the fundus of the womb is pressing into the anal ring.

Blood is found in the stools in melæna when it has been mixed high up in the bowels and blackened by the intes-

tinal gases. Or from hæmorrhoids, or anal fissure. Sometimes it comes in a hot gush at stool from the rectal lining membrane, without a gross lesion, as 'passive hæmorrhage.' Or it may be due to a foreign body in the rectum.

Relation of Bowels to Brain.—These relations are interesting, curious, and often of practical importance. Disease of the brain commonly leads to lessened vermicular action and constipation; while emotion may cause diarrhœa. Fear may relax the sphincter without affecting the fæces. Tubercular meningitis with diarrhœa closely simulates typhoid fever. A sharp purgative will often, by unloading the bowel, improve the circulation through the brain.

One point is of importance, and that is the melancholic feelings produced by a load in the colon, and relieved by its removal. Schroeder Van der Kolk pointed this out very clearly. In one case of constipation the depression of spirits was so marked that I felt sure there was some pelvic cause. The reproductive organs were examined without result by Dr. Broadbent; but on my persisting he examined the bowel and found a polypus, which was removed by Mr. W. F. Teevan, with satisfactory results. It is in a woman of highly developed nervous system that such reflex effects may be looked for. Some women are like an instrument so highly strung the least touch vibrates throughout the whole. A displaced uterus will often set up violent palpitation, which disappears with the replacement of that viscus.

Reflex Constipation.—When the vermicular action of the bowels causes pain, it is apt to be inhibited; perhaps without consciousness. Thus a tender ovary often gives rise to acute pain when the bowels move, from the pressure on it in defæcation; not only the general pressure of the expulsive efforts of the abdominal walls, but the pressure of the moving fæcal mass. Consequently the action of the bowels is arrested, and then constipation follows, with a load in the bowels and a generally worse state of matters.

Or it may be a tender uterus, or an irritable bladder, or piles, or fissure. Not uncommonly when there is tenderness of the lower lobe of the liver, there is an arrest of action in the ascending colon, with an accumulation making things worse. (Obviously here the bowels must be cleared, and be kept clear of load.) This is a form of constipation too little insisted upon in medical teaching.

Irritable Bowels.—With some persons the bowels are very irritable, and any laxative, however mild, gives great pain. As a comparatively temporary state this is seen commonly at the menopause. It is found with some delicate persons at all ages, but increases with years, speaking broadly. With such persons laxatives warm alike with carminatives and in temperature, alone are tolerated. (Hyoscyamus, or other of the solanaceæ, may be indicated to restrain the activity of the 'circular' fibre of the bowel.)

The old writers called the alimentary canal the *primæ viæ*, and paid great respect to it accordingly.

The anus may itch, with or without any eruption, when the liver is inactive: while a coppery blush around it in a baby may light up its father's early history, and, with it, much family trouble.

CHAPTER VII.

THE URINE.

THE subject of the urine has never been underrated by students of medicine: whether as the 'water-doctor' of a by-past time; or as the physiological chemist of the present day. Views have changed as knowledge increased. Not more than a generation ago the deposits in the urine were carefully examined; while now there remains only the general impression that phosphates are linked with exhaustion of the nervous system. Instead of the hopes of that day being realized, the very views themselves—that in such deposits the clue to many morbid states would be found—have fallen into oblivion. The significance of tubecasts remains unchanged. The interest now seems rather to centre round albumen; and its presence or absence is assumed to be the evidence on which the opinion is to be formed as to whether the kidneys are diseased or not.

[In writing on this matter the greatest caution has to be exercised. The examination-table has hard and fast lines which nature does not always rigidly observe. I must, then, insist upon the student who pays me the compliment of reading this book, fully recognising the fact that this work is not written for the examination-table. To the examiner he must carry what is taught him at his medical school. Examiners are generally teachers: they have some general agreement among themselves as to what will be expected, and what must be taught. The medical school takes the

fees; and undertakes to fit the student for the examination-table. With that contract I do not wish to interfere in any way! Therefore if the student elects to carry what is written here to the examination-table, he clearly understands that he does it at his own risk and hazard. If he hesitates about the grim significance of the presence of albumen, or sugar in the urine before an examiner, then the blame must not be made to rest on me. I accept no responsibility in connection with the examination-table: while perfectly willing to accept the responsibility connected with practice at the bedside. It is perfectly right and proper that the fundamental ideas of the student upon the subjects of albuminuria and glycosuria, should be that they indicate serious conditions. The first tells of kidney disease, a very grave matter; the latter of diabetes, equally serious. This aspect should constitute the basis of his views on these matters. But upon this basis, and upon it only, a superstructure of a more elaborate character may be built in accordance with what actual practice teaches. In writing on 'Granular Degeneration of the Kidneys,' in 1839, the late Sir Robert Christison objected to the term 'albuminuria' as indicating disease of the kidneys, under which heading M. Solon had written his treatise on disease of the kidneys, saying: 'The euphonious elegance of M. Solon's designation will not altogether atone for the philosophical error of naming a disease from one of its symptoms.' While in its review of M. Solon's book, the *Lancet* raised its protest against the term 'as a substitute for the phrase Bright's disease' ('De l'Albuminurie ou Hydropsie causée par Maladie des Reins,' June 23rd, 1833). It is assumed here that the reader has passed the portals of medicine, has left the examination-table behind him; and that he is beginning to grapple manfully with the complexities of practice.]

As to the detection of albumen, sugar, or hæmaglobuline, this belongs to hospital teaching. It is with the significance

of these matters, when found, this discussion is concerned. Recognition is assumed to have been made, and the presence of the various matters ascertained beyond doubt, before what is to be said here applies. First comes the bulk of urine.

Bulk of the Urine.—This is the first matter in which the young practitioner must engage in the consideration of the urine. And a difficulty meets him on the very threshold of his inquiry. Opinions vary as to the normal bulk of urine passed in twenty-four hours. This depends much upon the temperature around the body. When the skin is acting freely, the amount is smaller; consequently the bulk of urine is greater in summer than in winter. The quantity of fluid imbibed affects the question gravely. Some people, too, most undoubtedly have more active kidneys than others possess. Remembering all this, it may be said the bulk of urine passed in the twenty-four hours is normally about fifty fluid ounces, or two pints and a half.

In calculating the bulk of solids passed in any specimen of urine, the daily 'outflow' must be the basis of calculation. But the outflow has a significance of its own, quite independent of its relations to the 'output' of urine solids, or other constituents.

Traube taught the great matter to be borne in mind as regards the bulk of urine, was its relation to the blood-pressure in the arteries. When this was high, the bulk of urine was great; when the blood-pressure falls, the amount of urine drops with it. In the slack arteries of pyrexia, as seen in the specific fevers, the bulk of urine is low. In the tense artery of the hypertrophied left ventricle in granular kidney the bulk of urine is high.

The larger the bulk of urine the lower the specific gravity; except in glycosuria. That is a broad rule to be remembered. As regards what are spoken of as urine solids, the rule holds good certainly. The converse, too, is true; a urine of small bulk is usually a concentrated urine, highly

charged with urine solids. Speaking still broadly as to the question of 'output' and 'outflow,' it is held that more urine solids are excreted with a urine scanty in bulk, but dense; than with a dilute urine of large bulk, but low specific gravity.

Urine pigment is distinct from urine solids. But a high-coloured urine is a dense urine as regards solids, and is an odorous urine. A pale urine is a dilute urine as regards urine solids: although in glycosuria the urine is both pale and copious; but sugar is not a 'urine solid.'

The change in the bulk of urine is often most instructive. When the vasculo-cardiac changes of 'the granular kidney,' or 'the gouty heart,' according to the standpoint of view taken, are stealthily progressing with sure but silent step, the bulk of urine rises. In the early stage of 'chronic Bright's disease,' as a third person might choose to call the complex affection, the urine is copious and of low specific gravity. When in time the hypertrophied heart undergoes mural decay from fatty degeneration, and the vigour of the left ventricles relaxes in consequence, the bulk of urine falls. Like a dissolving view, the copious pale urine of the high arterial tension passes into the concentrated scanty urine of cardiac failure, as Sir William Jenner has pointed out. To put the question, 'Do you pass as much water as you used to do?' and to receive the reply, 'Oh, no; not nearly so much,' is to throw a strong light upon the precise position of the case in the long pathological process. It is entering upon the downward, and final change. When the reply is to this effect: 'Yes; more, I think,' then the case is at an earlier stage; on the ascent to the summit of hypertrophy. An increasing bulk of urine tells that the case is at the stage of waxing hypertrophy; the fall in bulk tells that the hypertrophy is being undermined by a histolytic process. In dealing with old and elderly persons, this question of the bulk of urine is one of cardinal importance, and will repay thought.

Then 'polyuria' is found after an hysterical attack, where there has been a tight artery, with or without palpitation. It is found with diabetes insipidus, and with diabetes mellitus, though not necessarily with glycosuria.

Then the bulk falls in febrile conditions, in dropsy, and in cholera (in the last probably from spasm of the renal vessels).

Ischuria renalis is suppression of urine. It may be found without organic kidney change, though this is rare. It is sometimes seen in that curious malady hysteria. If the urine is suppressed after it has been albuminous or bloody, then thrombosis of the renal vein may be suspected.

Characters.—The questions of colour and density of the urine have been spoken of to some extent in reference to the bulk of the urine. It varies as to colour in health, from 'limpid,' as after hysteria or a large draught of fluid containing alcohol, to 'straw-coloured' and 'brown sherry,' when concentrated by being long retained in the bladder, with a freely acting skin. The pigments of the urine may be normal, or the consequence of decomposition in the urine after being passed. A pale urine, after it has stood twenty-four hours, may be found decidedly pink. Purpurine is carried down with a lithatic sediment, as the deep pink deposit often seen after a cold, or in organic disease, especially in the liver. Bile is found in the urine in jaundice. The urine is 'smoky' in scarlatina when the kidneys are involved. The urine may be 'bloody' when blood is intimately mixed with it in the kidney. But the urine may resemble blood really; not merely as a loose expression by a careless observer (a high-coloured urine is constantly spoken of as 'like blood' by hospital out-patients); but really be so like blood as only to be distinguished therefrom by a chemical test. Rhubarb produces such a hue when the urine becomes ammoniacal; and such a urine once came under my notice when assistant physician at the West London Hospital, which was pronounced by everyone to be

'bloody,' only it did not lose its colour when it came to be boiled. Ordinarily rhubarb only gives a 'deep gamboge yellow' tint to the urine. Senna gives a 'brownish shade;' logwood a 'reddish tinge;' while santonin gives an 'orange red' with alkaline urine, and a 'rich golden yellow' with an acid urine. Creosote, carbolic acid, or tar give a 'dark brown' or almost black urine. This last is a suggestive urine truly; while the rhubarb red is very deceptive. Chylous, or milky urine, has a significance all its own.

Then the smell of the urine varies. The urine of the herbaceous animals is often ammoniacal; a change produced in human urine by decomposition. There are sundry drugs, as copaiba, cubeb, and turpentine, which scent the urine, as does asparagus, or even garlic. Diabetic urine has a sweet fragrance when fresh, passing into a sour odour on standing some time. The urine may acquire a tainted odour in supuration of the urinary tract.

There is one characteristic of urine not, to my knowledge, described in books, and that is an offensive smell when passed. Personally I have found it with pasty-faced, elderly women, with pale stools and evidences of liver-derangement. It seems allied to skatol or indol in its character, and is intolerable even to the patient herself.

Sediments.—These consist of the urine solids—tube-casts, epithelial scales, mucus, pus, or blood (when coming from low down in the urinary passages, so as not to be thoroughly commixed with the renal secretion).

Mucus and pus are suggestive of cystitis; and pus in the urine often irritates the urinary passages very markedly. They may indicate urethritis, or be vaginal in women. Strange discoveries of vaginal epithelium in the urine of bachelors, and of spermatozoa in female urine, have been made.

Tube-casts are suggestive of acute nephritis, scarlatinal or other; or of chronic conditions. They vary considerably in appearance and significance; but their discussion lies rather

with the 'anatomical' than the 'physiological' factor in diagnosis.

A phosphatic sediment was once the object of very minute scrutiny. It was held to be linked with nervous irritability and exhaustion, and those 'in whom the constitution may be considered as giving way, or, to use a common expression, breaking up.'—Prout. Mixed phosphates, too, are found with 'injuries to the back, by concussions, blows, or accidents, particularly if other causes of a predisposing or exciting nature favour the operation of such accidents.' A fall from a horse was a frequent cause of such injury. Prout quotes Brodie: 'The phenomenon seems to occur in other animals as well as man. Thus I have frequently observed jaded and worn-out horses pass great quantities of lime in their urine; the same also takes place occasionally in dogs, particularly of the sporting kinds.' But phosphates seem to have fallen from their high estate in medical opinion, for Wm. Roberts says: 'There is not the least reason to believe that there is any constitutional state specially characterized by an excessive excretion of phosphates; the phosphatic diathesis of Prout is simply ammoniacal urine.' While of 'ammoniacal urine' he says it 'is only in the rarest instances, and in the gravest circumstances, secreted ammoniacal by the kidneys, but usually becomes so by an after-change occurring in the lower urinary passages, or after it has been voided.'

Oxalate deposits were also once minutely examined, and an oxalic acid diathesis was held by Prout and Golding Bird. Here there is great nervous irritability with depression and incapacity to work, either mentally or bodily; while the sexual power is deficient or even absent. Roberts disposes of the matter thus: 'I am strongly convinced that oxaluria arises from a variety of conditions—many of them not accompanied by appreciable departures from health—in which the assimilation of food or the disintegration of the tissues goes on imperfectly, and that it is impossible to

assign any constant train of symptoms as the cause or consequence of oxaluria. At the most, oxaluria is only one of a long list of symptoms, and one of the least significant.' Bence Jones held oxalic acid to tease the brain very much; and Prof. Laycock held a bad champagne (made with rhubarb) an excellent test in a case of suppressed gout. Gouty persons are susceptible to oxalates, beyond doubt, and should avoid sorrel, rhubarb, and tomatoes; some even cannot take asparagus without suffering for it; and a small number are upset by broad beans. Especially is the effect marked where there is a sensitive urethra; and a knowledge of this enables one frequently to tell a gouty patient he has had rhubarb, or tomatoes, or a bad champagne—a matter which impresses him considerably.

Urea never spontaneously becomes a sediment in the urine, being the form of urine-excrement essentially belonging to a 'fluid' urine; while uric acid is the constituent, *par excellence*, of a 'solid' urine.—M. Foster. But lithates constantly form a sediment if the urine is chilled below the deposit-temperature. Uric acid is thrown down as urate of soda, urate of ammonia, and free uric acid. The clinical circumstances under which these three forms are deposited vary; but 'a urine which throws down urates will begin to deposit free uric acid a few hours after.'—W. Roberts. The highly soluble urate of potash does not deposit.

These lithates, or urates, are found under various circumstances. Their colour is not without significance, and the pink urate of a cold is well known. Sometimes it creates great and unnecessary alarm. A pale urate is the urate of indigestion, thrown down a few hours after a meal; while a higher-coloured urate belongs to organic disease, and is of bad omen in many cases. A urate is formed by the liver from the albuminous matters carried to it by the portal vein in cases of mal-assimilation. It may be a pale urate, or it may be 'lateritious,' 'fawn-coloured,' 'brick-dust,' or 'orange,' or 'pink,' sometimes a very deep pink indeed,

especially in old gouty subjects. Consequently the colour of the lithatic deposit is not unimportant. I wish it were possible to describe the significance of the colour of lithates in a satisfactory manner; but it is not so, and the reader must still think out their significance in each case for himself; it is not possible, as yet, to do his thinking for him on this topic. Having given much thought to it, and believing it to be important, the subject will be put before the reader as well as may be—at least, his attention shall be drawn to it.

Older writers, as Prout, have studied this question; but it may be well to give a recent authority first. William Roberts says:—‘The frequent or constant occurrence of a brownish or red urate deposit, without or with only a feeble degree of pyrexia, is a circumstance to awaken suspicions of some serious organic disease; but the indication is more general than special. Organic disease of the lungs, heart, spleen, or any other part, attended with emaciation and waste of the tissues, is usually accompanied with abundant deep-coloured urine deposit.’ Prout wrote: ‘During feverish or other derangements, in which the functions of the hepatic system are particularly involved, the lithate of ammonia is not only supposed to be derived from the imperfectly assimilated chyle, and the deteriorated albuminous principles of the blood, but also from the deranged secondary assimilation of the albuminous textures of the body.’ In organic disease of the liver, quantities of uric acid may be found in the urine (Murchison); while tyrosin is found in the urine in acute yellow atrophy of the liver in notable quantities. These retrograde products of albuminoids hail from the liver, whether that viscus is the subject of disease itself as cancer, or is functionally perverted by general systemic disturbance; perhaps set up by disease elsewhere.

Then as to the pale urates of indigestion, they have long been recognised. Roberts says of them: ‘Functional de-

rangements of the digestive organs are also generally accompanied by pale urate deposits in the urine.'

The subject has attracted my attention, and the summary is as follows:—'Urates themselves are colourless, but the amount of pigment they carry with them varies with the different circumstances under which they are formed; hence the significance of their colour. The paler the urate deposit, the more urate of soda is present; the deeper-coloured, the larger the proportion of urate of ammonia. White deposits of urate of soda are associated with indigestion; deep urate deposits with pyrexia, organic disease, or the concentrated urine of venous fulness, as in cardiac failure' ('Indigestion, Biliousness, and Gout in its Protean Aspects,' Part II. p. 277).

Free uric acid in rhombs is found under circumstances of its own. It is common in strumous children, and the acid irritates the urethra no little in many cases. Sometimes the irritation of the bladder leads to wetting the bed at night. Uric acid calculus may readily be formed. The 'cayenne grains' of uric acid are as marked in such children as they are in gouty adults. The union of gout with struma seems the combination favourable to free uric acid. The appearance of lithic sediments is not to be feared; rather is it hailed with delight by the patient. 'It is not when you see them, but when you don't see them, that you are to be anxious,' said a shrewd old doctor to me in early days. This is worth bearing in mind as to their significance. 'Whoever has attended much to urinary diseases must have remarked that many individuals subject to derangements of the general health seldom feel so well with respect to their health, as when lithic acid deposits take place in the urine.'—Prout.

Lithic acid is found in the gouty; also with those who have resided long in hot climates, especially those who have had hepatic trouble, when it is present most in the winter months; and again in 'middle-aged females who laboured (or are about to labour) under chronic uterine

disorder; especially of the malignant kind. Thus lithic acid deposition has a varied significance.' Prout continues, 'When the deposition of lithic acid appears about the middle period of life, for the first time, in broken-down constitutions and unhealthy subjects, so far from bringing relief or indicating a favourable result, as in the first class of affections above stated, such deposition is not unfrequently the sure forerunner of a general break-up of the system, and of speedy dissolution, of which I have seen a great many instances.' He also observed the relation of lithic acid to diabetes. 'Such a combination is by no means unusual in corpulent middle-aged individuals of a gouty strumous habit, and is always to be viewed with some degree of anxiety.'

The subject of the lithatic deposits in the urine is fraught with interest on every side. The subject, however, is only attractive to reflecting persons.

Urea.—This is the normal form of the retrograde metamorphosis of nitrogenized matter in warm-blooded animals with a fluid urine; no matter whether the debris of tissue, or the luxus consumption of albuminoids beyond the tissue-needs. In some hepatic conditions almost the whole of the albuminoids are transformed into urea, the Baruria, or Azoturia of various writers. Urea is often found in large quantities in diabetic persons, possibly often the result of the meat-dietary followed out to excess; sometimes perhaps the result of an exciting cause common to both, as mental anxiety, disturbing the liver alike in its glycogenic function, and its second function, *i.e.* the metabolism of albuminoids.

In febrile conditions there is a great quantity of urea formed, sometimes a very large quantity, from the tissue-disintegration caused by a high temperature.

The amount of urea in the urine is small in chronic Bright's disease, whether gouty or albuminuric.

Albuminuria.—The presence or absence of albumen in the

urine is now almost universally assumed to be the test of the presence or absence of Bright's disease. There is a delightful simplicity in thus settling a matter which really presents the greatest difficulties in many cases. The whole question is too exclusively made to turn on the accuracy of the observation, and the method employed. The student is taught the different tests, the sources of fallacy of each, *usque ad nauseam*. Allow me to assure him, as emphatically as it is in my power to do, that the question of the detection of albumen in the urine is easy by comparison with the difficulty of estimating its importance when it is found. Shortly after Bright had familiarized the medical mind with the importance of examining the urine, and shown the relation albuminuria holds to the diseases which bear his name, when albumen was found in the urine it was assumed to be the herald of coming dissolution. Death was soon to follow. Old practitioners have told me how the detection of albumen in the urine was followed by the fear of death in medical men themselves at that time. On its discovery, by any accident, they took to bed, settled their worldly affairs, and prepared for the final change. But finding after a time that they were not perceptibly worse, they began to get up and go about; and feeling no evil effects therefrom, resumed work; regarding their scare with mingled feelings. They had trodden 'the valley of the shadow of death' in anticipation. As years rolled on they told the tale of the past as an instance of the fallacies of medicine. No doubt when the urine is seen to undergo the significant opacity as the boiling point is reached, the apprehensions are naturally aroused; and a timid man may feel a dread creep over him as if the rustle of the wings of the King of Terrors was already audible. The feeling is a natural one, and does not indicate cowardice. What I wish to insist upon is—taken alone, the presence of albuminuria is of doubtful significance. It is certainly well to start off with the assumption that

it is of grave significance ; the debatable point is this: Is it well to rest there? That is the question. On the other hand, Dr. Mahomed has written a thesis, to my mind of very high value, on the topic: 'Chronic Bright's Disease without Albuminuria.'

It is a well-recognised fact that in cirrhosis of the kidney, the granular, or gouty kidney, albumen is only present fitfully; and is often altogether absent for long intervals. Albuminuria then is but one, albeit a very important one, of the evidences of renal disease. Something more is required than the behaviour of the contents of a test-tube to settle the question of renal changes.

What I wish the reader fully and rationally to realize is :

- (1) There may be albuminuria without renal disease; and
- (2) There may be renal disease without albuminuria.

And if the examination-table does not insist upon the recognition of these two great clinical facts, actual practice, he will find, does insist upon it. Admitting to the full the value of the discovery so linked with the name of Bright, it is equally necessary to urge caution and judgment as to the interpretation to be put upon albuminuria.

The discovery of albuminuria dates back far beyond the time of Bright. In June, 1811, Dr. Wells 'considered the subject of serous urine in a truly elaborate manner,' in a paper he read before the Society for the Improvement of Medical and Chirurgical Knowledge. While Bright's famous Gulstonian Lectures were delivered before the Royal College of Physicians in 1833, from whence date our modern opinions about albuminuria.

In the 'Library of Medicine' Sir Robert Christison wrote of 'Granular Disease of the Kidney' as follows:—'Albumen is commonly present;' and 'It is sometimes, however, absent altogether for a time, especially when the urine is discharged more freely than natural.' Then he makes two very practical remarks, well worth quotation, as furnishing material for reflective thought. 'Its proportion generally

increases when incidental inflammatory action is excited; and in that case the urine puts on the characters of the acute form, except that its density remains low;’ that is one. Then ‘It is a complete mistake to hold with some late authors that the albumen increases in proportion as the disease advances;’ that is the second. The reader will see from this it is not correct to assume that renal disease is not present because there is not albumen in the urine. That is a cardinal fact to remember. Dr. Prout, an authority on whom equal reliance can be placed, made this division :

SPECIES a. Serous Urine: the kidney in a state of health.	} Var. 1. Quiescent. Var. 2. Inflamed.
SPECIES b. Serous Urine: the kidney in a state of degeneration.	

In speaking of the difficulties surrounding the subject, he writes trenchantly :—‘ With respect to illogical reasoners, it may be observed that there are some minds so singularly constituted, that they appear to be unable to comprehend the distinction between a general and a universal law ; *i.e.*, between a general law, founded on experience, and therefore admitting of exceptions, and a universal law, founded on reason or necessity, and consequently admitting of no exceptions. Of this remark the subject of serous urine affords a striking illustration. Forgetting that all they know on the subject of serous urine is founded solely on experience, and assuming as the basis of their argument the illogical grounds that serous urine *always* denotes disease of the kidneys, some have deduced from the admitted exceptions to the law the opposite, and equally illogical conclusion, that serous urine does *not* indicate disease of the kidneys. To point out instances of such illogical reasoning would be invidious; while the attempt to refute it would be waste of time.’ Certainly, Dr. Prout, it might be waste of time, but the illogical reasoner on

albuminuria exists still; perhaps is even more common than he was! He held that when the urine was of high specific gravity, of deep colour, of moderate or rather diminished quantity, when the lithate of ammonia was present, the prospect was good in chronic degeneration, as compared to the opposite condition. Here the bulk of urine is large, it is pale-coloured, and of low specific gravity; sometimes the bulk is large, but when to the above the bulk is small, then an advanced condition of the disease is present. Of course when any intercurrent congestion or inflammation be present in chronic renal disease, whether there be albuminuria ordinarily present or not, at these periods of acute action the albuminuria is conspicuous. The surroundings of albuminuria, even other matters connected with the urine itself, were estimated by Prout in trying to realize the significance of albuminuria.

It may now be well to see the position of albuminuria by the light of more recent opinion. William Roberts says:—‘Slight and temporary albuminuria appears to occur occasionally from very slight disorders. Beneke, when suffering from dyspepsia, noticed albumen in his own urine four times in as many weeks. Similar observations have been made by others (Parkes). Setting aside these unimportant exceptions, albuminuria must always be looked on as a grave symptom of disease; and when discovered it becomes an anxious question to the practitioner: What signification has it?’

He continues:—‘When albumen is found in the urine, the important point to decide is whether it indicates the existence of organic disease of the kidneys or not. This question in any individual case must be considered chiefly in connection with the three following points, jointly, namely:—

1. The temporary or persistent duration of the albuminuria.

'2. The quantity of the albumen; and the occurrence and character of a deposit of renal derivatives.

'3. The presence or absence of any disease outside the kidney which will account for the albuminuria.'

In connection with this last he says :—' When the urine is found permanently albuminous, and there exists neither pyrexia nor thoracic disease, or other recognisable condition which can account for the albumen, the inference is almost irresistible that there exists a primary organic disease of the kidneys.'

The most recent and solid utterance on this subject is that on Albuminuria in Quain's Dictionary, by Dr. T. Lauder Brunton, F.R.S., whose opinion is entitled to our highest respect. He writes :—' In order to distinguish more clearly between the different kinds of albuminuria we may divide them into—1st, *true* albuminuria, in which serum-albumin appears in the urine; 2nd, *false* albuminuria, in which some other albuminous body, but not serum-albumin, is present. In *true* albuminuria there is always some change either in the circulation through the kidney, or in the structure of the kidney itself. In *false* albuminuria the albuminous body passes out through the kidney, without there being any alteration either in circulation or structure. The chief albuminous bodies occurring in *false* albuminuria are hæmoglobin, egg-albumin, and Bence Jones' albumin.' Now, if the young practitioner cannot trust himself to distinguish betwixt 'serum-albumin' and other forms of albumen—and no one will hold him cheap for such diffidence—the best thing for him to do is to send the patient to some one who can make the distinction; or at least, whom he believes can do so.

Indeed, in all cases of albuminuria in important lives, at least, the young practitioner will act wisely and prudently, in his own interests as well as the patient's, in consulting some older person. But not as a means of relieving himself from the necessity for close study of the case;

certainly not that! But to share the responsibility which attaches to him under these circumstances.*

In cases where the finances of the patient will not admit of this, act warily. If a club patient presents himself, complaining of feeling ill, and no ostensible cause be apparent, then it is well to examine the urine; and, if either albumen or sugar be found, to keep a watchful eye on him. Take the albuminuria in connection with its surroundings. On the other hand, when a person feeling well is found to have albuminuria, do not lose your head; and frighten first yourself, and then your patient, and that patient's friends! If you err, they may not make that allowance for the error that acquaintance with the difficulties of the subject would cause them to make: they only know you erred, as time goes on and does not verify your opinion.

Finally, do not commit the common error—for error it undoubtedly is—of confounding albuminuria with Bright's disease. That this is quite commonly done is no excuse for so palpable an error. The diagnosis of chronic renal disease does not turn on the behaviour of the contents of a test-tube, taken alone. 'Taken alone,' please note, reader!

Glycosuria.—This term is to be preferred to that of 'diabetes' for diagnostic purposes; because diabetes is a grave disease, of which glycosuria is but a symptom—albeit a very important symptom. 'Glycosuria' is no more 'diabetes,' than 'albuminuria' is 'Bright's disease'!

In order to give the reader a clear impression of the clinical aspect of diabetes, the subject will be treated somewhat historically. Prout (1849) put the position thus:—

* And here let me give my reader a word of caution, as I might to a younger brother; indeed, he is 'my professional brother': do not look merely at the present; all may be satisfied and confident in him at the time. But if the case goes wrong, some very unpleasant and unfair things may be said—and often are said. And a man has to guard his own reputation, as well as do his honest best for his patient.

'The general *prognosis* in diabetes must be considered as unfavourable. Among the *favourable* symptoms in this affection may be enumerated, a moderate flow of urine of a specific gravity not higher than 1035 ; the appearance in the urine of lithic acid either in its amorphous or crystallized form ; the recent appearance of the disease, and the absence of thirst ; the retention or gain of flesh and strength ; and, more than all, immunity from organic disease—more especially from organic disease of the lungs. On the contrary, when the flow of urine is permanently excessive, and of high specific gravity ; or when the secretion is pale-coloured, opalescent, and serous ; when the thirst, emaciation, and debility are extreme ; or when organic disease, particularly of the lungs, is present, the chance of recovery is much diminished. But when, as is too frequently the case, several or all of these unfavourable symptoms co-exist, the chance of recovery is not only diminished, but *absolutely hopeless*.' Here Prout puts the whole matter concisely and clearly.

Niemeyer recognises a difference in cases, saying : 'There is no doubt that patients in comfortable circumstances, and who possess the means of taking good care of themselves, hold out against diabetes much longer than those who are obliged to take refuge in hospitals. A complete and permanent recovery from diabetes (if it ever occur at all) is extremely rare, although plenty of cases have been recorded in which a pause in the symptoms, of longer or shorter duration, has been observed.' That even severe attacks of diabetes—that is, of glycosuria accompanied by other symptoms—are recovered from, is not so extremely rare in this country. Several have come under my own notice from time to time.

Glycosuria, beyond the grave and fatal disease of 'diabetes mellitus,' which runs a course of from one to three years, it has been calculated, may be found with two other sets of associations in my experience. They are : (1) Acute attacks

of sharp diabetes, passing away in a little time; (2) a chronic condition which goes on without working any constitutional ruin, usually occurring in well-nourished persons.

(1) These attacks may be fatal, but not necessarily so, much depending upon the treatment adopted. Certainly, in all cases it is well to give a guarded opinion, representing faithfully your impressions. But every now and again you will be agreeably surprised to find that your grave prognosis is not verified. Since commencing this section, an old lady has been in my house, hale and strong for her years, who two years ago was regarded as hopelessly ill with diabetes by three excellent provincial physicians met in consultation. In an address to the Clinical Society, at its opening for the session 1882-83, Dr. Andrew Clark, referring to a state of temporary albuminuria occurring under the strain of prolonged competitive examinations, said: 'Of the young men competing for places in the Indian Civil Service Examination, I have ascertained by repeated personal examinations that more than one-tenth become albuminuric.' He continued, 'I will conclude with merely mentioning the glycosuric storms which, without sensibly damaging the body or materially impairing health, come and go through a lengthened life.' It seems highly probable that acute attacks of what are really 'glycosuric storms' are mistaken at times for diabetes.

(2) Many medical men have told me of the horror with which they recognised the fact of there being sugar present in their urine. Testing a doubtful specimen, to be sure about the test, they proceeded to examine their own urine, believing themselves to be in perfect health, and found it to contain more sugar than the doubtful specimen. After a while the sugar disappeared, to their great delight and relief. (In some cases a rigid non-saccharine dietary was adopted with such severe results, that it had to be modified considerably.)

Then there are persons who are well nourished who

experience a 'glycosuric storm,' from some cause of mental character; and who find more or less sugar in their water ever afterwards. Speaking to Sir William Jenner some time ago of these cases, he said he had a number of glycosuric cases under observation, who did not seem to be much the worse therefor. My comment was, 'Stout, well-nourished persons do not die of wasting maladies;' with which he agreed. Glycosuria when causally linked with mental shock, strain, or worry, may be a mere 'glycosuric storm,' or may be the 'classical diabetes,' as W. Roberts terms it. (Much depends on what is done. Relief from the cause of the diabetes will commonly bring with it great amelioration, if not cure. While if the patient go on in his way death is before him.) One case is well known to me where a well-nourished man is well ordinarily, but who gets a 'glycosuric storm' whenever worried with business. Many stout men are glycosuric without apparent injury to their health. Sometimes the urine varies, being copious, opalescent, and laden with sugar; while at other times it is amber-coloured, and deposits of lithic acid are found, not copious nor of high specific gravity. Here the condition is found to vary with the demand upon the brain. In fact, betwixt these last, where the glycosuria may be regarded as a 'waste-pipe' affair, the running off of the luxur consumption of sugar; the patient subject to 'glycosuric storms;' and the 'classical diabetes,' there are a variety of grades not yet worked out: and which constitute in practice great stumbling-blocks.

William Roberts says:—'The progress of diabetes is usually equable and continuous; but cases are met with, not very unfrequently, in which the symptoms intermit—the saccharine state of the urine ceasing and recurring at intervals. Dr. Bence Jones has published an account of several such cases in old persons; and I have encountered similar ones in my own practice.' Of these old persons spoken of by Dr. Bence Jones, there were 29 in all; eleven over 60,

and six over 70. Dr. Roberts says of this class:—‘In patients of this class I have generally found that although the diabetic symptoms proved mild and amenable to treatment, life is seldom prolonged beyond a few years. The glycosuria may disappear or become insignificant; but the constitution is evidently broken, and they die in two, three, or four years, either from cerebral disease or from pulmonary complications.’ (Group III. p. 144.) From this it is abundantly clear that glycosuria may not indicate diabetes, but be rather a prodroma of constitutional failure.

In speaking of ‘Milder Types of Diabetes,’ Roberts summarises thus:—‘The cases brought together under this heading are somewhat miscellaneous; and they do not present those marks of uniformity which are required to constitute a homogeneous pathological group. They are separated from classical diabetes by certain broad distinctions of clinical importance; but they exhibit among themselves certain disagreements which make it evident they represent more than one type of disease. From ordinary or classical diabetes these milder types are distinguished by all or some of the following signs:—Absence of a fixed tendency to a fatal termination; absence or only a moderate degree of thirst; voracity or emaciation; slight or temporary increase in the quantity of urine; transitory duration; amenability to treatment; slight, moderate, or intermittent glycosuria.’ He then gives three groups into one or other of which these cases usually fall:

‘Group I. Urine persistently saccharine; density 1030 to 1043; diuresis absent or very moderate; no excessive thirst or appetite; moderate conservation of strength or flesh; stationary conditions.

‘Group II. Glycosuria temporary or intermittent; thirst or diuresis moderate, or none; little emaciation or loss of strength; the complaint depending on mental anxiety, blows on the head, or concussion of the spine, and terminating in complete recovery.

'Group III. Glycosuria in persons advanced in years; of full habit; moderate conservation of flesh and strength; moderate diuresis; moderate amount of sugar; abundance of uric acid deposits; often gout; sugar sometimes present for years, varying greatly in quantity, sometimes intermitting; termination variable.' (See p. 143.)

The subject has been put before the reader as fully as the scheme of this work will permit. Glycosuria may be a 'waste-pipe affair,' or a 'neurosis,' or a 'glycosuric storm;' or it may be a symptom of 'classical diabetes.' But at the examination-table it is always the last: unless it be the examination for the Membership of the College of Physicians of London!

Hæmoglobuline.—When testing the urine with nitric acid, and still more on boiling it as well, a pink hue is often evolved. This indicates the presence of hæmoglobuline, or 'uro-hæmatine,' as it has been termed. It usually occurs in weakly conditions. Its significance has not yet been appraised; and little is said about it in text-books. It would seem to indicate a waste of red blood-corpuscles.

So much then for the modifications of the urine; now something may be said as to the information to be gained from the act of passing it.

The Act of Passing Water.—My own surgical knowledge having grown somewhat rusty, application was made to Mr. W. F. Teevan, whose knowledge is unquestionable on this matter, from whom the following observations are taken:—

In stone the stream of urine is only interfered with occasionally and suddenly, from the stone obstructing the urethral orifice of the bladder. In enlarged prostate and stricture the outflow is interfered with persistently, and sometimes there is actually retention. In enlarged prostate the urine comes out 'drop by drop,' and is not projected in front of the patient by any effort he can make; while there is a dribble at the end of the act in the less advanced

cases. In stricture there is a small stream, but stream it is, usually, with pain in the act; while in enlarged prostate the pain is felt when the bowels move.

Incontinence of urine may be due to an overfull bladder, 'retention with dribbling;' or it may be due to loss of power in the sphincter; or be associated with piles. It may be due to hysteria; though in hysteria inability to empty the bladder is much more common. It may be due to spinal injury, or to disease of the brain.

In children it may be due to an irritant character of the urine, which is loaded with lithic acid; or to irritation elsewhere causing the sphincters to relax in sleep; or to hyperæsthesia of the bladder-centres in the cord.

Then there is the matter of 'getting up at night to pass water.' This may be once, or very frequently. It of course depends to some extent upon the amount of fluid imbibed, to the state of the skin, and to the character of the urine itself. But when it is found as a habit, it is held to be suggestive of kidney change; and is an important symptom, taken with other semeia. It usually goes with the strong heart and the tense artery. Sometimes when the person has to get up frequently, it is due to an hypertrophied bladder behind an enlarged prostate or a stricture; at other times its associations are with disease of the cerebro-spinal system.

CHAPTER VIII.

THE REPRODUCTIVE ORGANS.

THE reproductive organs in man are comparatively unimportant to the physician; but it is far different with woman. With man they represent that surplusage of vigour which underlies the sexual passion; while woman, not inaptly, has been spoken of as 'an organism around an uterus.' Consequently the physician sees little of the derangements of these organs in man; though the surgeon is familiar with the after-consequences of youthful folly, in the form of strictures of the urethra. But with woman, many of her maladies are linked, directly or indirectly, with her womb and its surroundings; whether in single or married life, it matters comparatively little. Yet, except the grave cases which engage the attention of the obstetric physician, the student sees little of the maladies of woman in his hospital career: probably finds the subject of functional disturbance largely ignored by the ordinary physicians! Ignorant of them, he enters practice; unconscious of his ignorance probably, though his female patients soon discover it, he is at length aroused to their importance, and studies them seriously—after much lost time; perhaps after the loss of many patients who have gone elsewhere, on discovering his want of familiarity with 'female troubles.' Such is indeed the position of most young practitioners on their entry upon professional life.

It is desirable, then, that something be said here which

will help him; for the reproductive organs are delicate ground, on which it is well to walk warily.

Loss of Sexual Power.—The sexual power is not necessarily removed by wasting disease; indeed, in phthisical cases, it remains till very near the end. It is lessened in mitral disease; and never appears in the cyanotic subjects of congenital heart imperfection. In diabetes it soon disappears. All intense anxiety abolishes it to a large extent. It is said that a shrewd North-country practitioner observed in the Cotton Famine of 1862, that many of the Lancashire mill-owners, face to face with ruin, fell ill, and lost all sexual appetite. Armed with this knowledge, he met them on the threshold of his inquiries by asking as to their sexual vigour. Such a direct question put so soon in the interview impressed the patient immensely; and it is said that his keen observation in this matter secured him a golden harvest.

It is much more common to find a young man believing himself to be impotent as a consequence of evil practices in the early days of puberty. If he is about to marry, he will worry himself no little; especially if a conscientious, decent fellow! The more he worries, the more lamentable his condition. He is in entire ignorance of a physiological fact to be mentioned immediately, and his conscience becomes morbid and overexact. He fully believes he has lost his manhood; especially if he has been weak enough to read any of the numerous quack books on the subject, which harpies vend to prey upon human frailty. He is intensely miserable, and perhaps tries to put his powers to the practical test, with the result of absolute failure. Carpenter speaks of emotional impotence: 'Here we have a striking example of the utter powerlessness of the will, in the well-known fact that no amount of sexual *desire* will produce erection if the mind be possessed with any feeling of doubt or apprehension as to the existence of the sexual *ability*.' Such emotional impotence of a temporary character may

occur to any one, even in perfect health. 'Sexual desire,' as contrasted with 'sexual ability,' is differentiated by Carpenter by italics. The distinction should be remembered in all cases.

When there is a catarrhal condition of the vesiculæ seminales, then a glairy fluid is poured out after the act of micturition, and still more on defæcation, from the local pressure. These conditions rarely create any alarm, except when the conscience is implicated.

A man may have no power of erection, and yet have sexual desire with perfect semen. At other times the sexual act is normal, but no result follows from absence or imperfect development of the spermatozoa. Or a couple may be childless and separate to mate with others; when the female becomes prolific, while the male is gratified by being a sire.

Increase of the Sexual Power.—This is termed priapism in aggravated forms. It may be the result of convalescence from acute disease, notably yellow-fever; or it may result from cantharides having been used intentionally, or by accident. It may be set up by disease in the posterior occipital lobes; or, in its most marked form, it may be due to fracture of the spinal column in the lumbar region. In the early stages of tabes dorsalis, otherwise locomotor ataxy, the sexual power is often markedly increased, especially in the Arab type of man (p. 11). In vesical calculus the ardor veneris is sometimes very pronounced in paroxysms, accompanied by acute pain.

In woman the disturbance of the sexual feelings is less indicative of disease, or disorder than is the case with man. Local causes, as seat-worms, affect both sexes alike; but if a thread-worm creeps into the vaginal orifice, it will excite the most pronounced local irritation with a corresponding psychical attitude. Local causes of pruritus are often troublesome as eczema, especially when due to the sugar-laden urine of diabetes. Consumptive girls are salacious, while the opposite is the case with the subjects of valvular disease

of the heart ; much of course depending upon temperament. Rich food, luxurious couches, and foul fiction are responsible for much sexual excitement in young women, that could very well be dispensed with. This fouling of the mind is the exciting cause of much that is injurious and undesirable ; and whether relief be sought in normal or abnormal ways, or unchaste thought be co-existent with bodily purity, this toying with the sexual feelings is to be condemned ; and is often to be deplored.

Of course it is when budding into puberty that the mental perturbation caused by the inrush of novel and absorbing ideas is most marked ; but great sexual excitement may mark the involution as well as the evolution of reproductive activity, after which woman glides into a sexless existence.

There is no subject which will make greater demands upon the reflective powers of the practitioner than the sexual instinct. Some put it aside as if something unclean and unmentionable ; others fall back upon it at once and instinctively as the ever-acting cause of all disturbance of the health that cannot readily and obviously be accounted for. Both extremes are foolish, while the latter is often grossly unfair. The introduction to the Marriage Service of the Church of England tells of a coarse age ; and, still more, of that curious meddling with the sexual instinct to which the celibate clergy of Rome have ever been addicted. The sexual instinct has not to be banned by the priest ; but intelligently comprehended by the physiologist-physician.

The Catamenia.—When puberty is reached by women, psychical changes are the correlative of physical development, and rhythmic flows from the generative organs are established. This, really, represents the surplus wave of nutrition, as it is aptly termed. That is, the organism is now sufficiently developed to take on new duties, to which it is urged by novel promptings. But it just happens in this imperfect world that this new demand often comes

somewhat early and before the need for it is apparent. It would be infinitely better for the child-wives of India if puberty were longer delayed with them. In our own climes puberty comes all too soon with many, and the new body-expenditure arrests the growth and stunts the organism; while the mind, not yet sufficiently developed to sustain the impetus of the sexual passion, reels under it and becomes depraved. Especially is this the case when a premature development takes place amidst an unclean environment, and the mind is debauched by what it is surrounded by. Children have not pure minds always; and the premature advent of puberty to impure-minded children has been described by Maudsley thus:—‘Given an ill-constituted or imperfectly developed brain at the time when the sexual appetite makes its appearance, and what is the result? None other than that which happens with the lower animals—simply lust. While servants are not all endowed with self-respect, a French *bonne* is a moral plague very often to her young charges.’

In other girls the pubertal changes produce little disturbance, physical or psychical, and growth goes on apace. The well-grown, well-developed girl, who is so attractive to the opposite sex, is cleanly-minded, as well as pure bodily; because pubertal changes have not overwhelmed her, as is the case with many small girls. This matter has a great deal to do with the mental traits of small girls, as compared to those of well-grown girls. To a less extent, the same may be said of man—making all allowances for families of small stature, as well as for races which are undersized.

It is well then to inquire when the catamenia appeared; whether they are regular or irregular, scanty or profuse; whether indeed the generative expenditure is great or small, little or excessive. This will throw much light on many a case. For instance, a young woman is supposed to be phthisical, and has a persistent and suggestive cough. But on inquiry

it is found that she is profusely unwell, eight days every three weeks, with considerable leucorrhœa. It only needs the condition of night sweating to be added to this, and then the physical signs of lung trouble will not be long in making themselves manifest. My experience, as physician to a chest-hospital, tells me, in unmistakable accents, that if careful inquiry into the general condition preceded physical examination, no matter how precise, in a great many instances, a truer estimate of the nature of the case would be formed. It might dawn upon some minds under these circumstances that the lung-mischief is not so much the cause, as the consequence of the state of the general health ! Women themselves never underrate the importance of the catamenial discharge ; its arrest, or its excess. Some indeed go to the opposite extreme to some young medicos ; and if these last almost forget to consider that 'physiologically a woman is an organism around a uterus,' these women seem never to be able to forget this fact.

Amenorrhœa.—The menstrual discharge may never be established ; sometimes from lack of the requisite organs, more commonly from lack of developmental energy. Thus the cyanotic victims of congenital imperfect evolution of the heart may live to the years of puberty, but they never accomplish the pubertal changes ; so far as I have been able to learn. Then weakly dwarfed children have no surplus wave of nutrition to take the form of the catamenia. In some families, fortunately for them, pubertal changes are late in appearing. In other cases there is much disturbance of the health, indicating the perturbations which herald the appearances of the menses ; and the girl's mother earnestly pleads : 'If you could only bring *them* on, sir, I am sure she would be better.' Quite so : if there was any way of bringing them on except that of raising the body-income till a surplus wave is possible. To attempt by oxytoxics to start the catamenial life in an ill-nourished girl would be as unwise as it would probably be abortive. Is it desirable

to call into existence a new demand upon an ill-nourished organism? Reason can answer the question. Fortunately, it is scarcely possible to achieve such an undesirable consummation!

Then there is what may be called 'conservative amenorrhoea,' that is a cessation of the menses, because the system can no longer afford such a body-expenditure. Nature stops off this extravagance, as it becomes under the circumstances of malnutrition. Here the arrest of this mensual outgoing is most desirable, and is followed by systemic development. The body-income becomes equal to the body-expenditure; and something more. It is easy to allay the maternal anxieties when the case is put clearly. Unfortunately, in many cases, this piece of conservatism is not accomplished, and the organism suffers. Here the outflow is too frequently maintained by habits and by thoughts which keep up a state of high vascularity in the generative organs; for erectile tissue is not confined to the male. The system here is subordinated to the generative expenditure, and suffers accordingly. In the struggle betwixt nutrition and the reproductive energies, the nutrition fails. A curious illustration of the antagonism of nutrition and reproduction is seen in the sterility of prize heifers which have been unduly fattened all along; and another is the stunted pine, covered with abortive cones, as compared to the few but perfect cones of a more healthy tree. The dwarfed fir-tree covered with abortive cones corresponds closely to the stunted girl, when her generative expenditure has got ahead of her body income. When the catamenial loss is excessive, its comparative arrest is followed by great general improvement. How can this excessive demand be brought about, it may be asked? How can a surplus wave of nutrition be transformed into an excessive drain upon the system? That such is the clinical fact is unquestionable; however defective the explanation may be! In some cases an irritable ovary may keep the generative organs in a state of high vascu-

larity, of which menorrhagia and leucorrhœa are the outcomes.

It is highly desirable that these relations of the generative expenditure to the body nutrition be carefully thought out; because if this be thoroughly done, the right line of treatment will suggest itself in many cases, otherwise not easily dealt with. The correct diagnosis indeed is fertile in result; but an imperfect diagnosis is as sterile as the stunted pine just spoken of.

Amenorrhœa is physiological in the states of pregnancy and lactation; though this is not invariably the case. So long as the menses do not occur in lactation, so long is that woman barren; as many women know well, and who decline to wean their children accordingly. In others, suckling confers no such protection against impregnation. Fecundity and the sexual appetite have no definite relation to each other. Then the menses cease when the reproductive life reaches its close, and this may occur early—in one case known to me, at twenty-six—or be delayed. When in general practice, I attended a woman in childbirth at fifty-one. Usually, the menopause occurs at forty-five. The normal period of the reproductive life of a woman in the temperate zones is thirty years (from fifteen to forty-five).

It was long held that menstruation corresponded to ovulation. That they are closely connected may not be denied. But that menstruation depends on ovulation is contradicted by the fact that menstruation may go on after the removal of both ovaries. Such a removal does not unsex a woman; but, of course, it renders her sterile.

Menorrhagia.—The catamenia may be said to cover four days of the mensual cycle of twenty-eight days. For twenty-four days a gradual ascent is made, while the descent occupies a much briefer period. It is commonly spoken of as 'the menstrual week of the catamenial cycle.' But the catamenia may continue more than four days;

while the cycle is much less than a lunar month. The catamenia may last a week and come on every twenty-one days, or even every fourteen days. They may even be the last, and be profuse too. Here, of course, it is abundantly clear that whatever be the ostensible malady complained of by the patient, this excessive loss is what the doctor must attend to for successful treatment. When that has been arrested the more especial malady may be the object of therapeutic attack; or the two may admit of a combined treatment. When there is mal-nutrition the arrest of the drain will add materially to the body-gain—'a penny saved is a penny gained.' Indeed, to check the loss is often a more important matter than to raise the body income.

Dysmenorrhœa.—Great suffering may accompany the menstrual act. In some cases the suffering is chiefly before the loss comes on; in others, it continues through the period. The suffering is usually much diminished towards the end of the flux. It is difficult in some cases to say which taxes the system most; the loss of blood, or the loss of nerve-energy from the severe pain. For instance, in many cases the oleum Pulegii gives great and pronounced relief from suffering; but this is counterbalanced by the increase in the flux in some instances, so that it becomes a question whether it is desirable to resort to the penny-royal, or not.

Dysmenorrhœa may be due to a narrowing of the neck of the womb, or to clots blocking the orifice. Here recurrent pains, resembling the bearing-down pains of parturition, are present; and when a clot is the offending cause, the paroxysm may cease with a gush of blood.

Dysmenorrhœa is infinitely more common as due to some ovarian condition. The ovary is tender, sometimes enlarged. The perturbations so excited manifest themselves throughout the whole system; the nerve-waves set up in the ovary may break on any terminal nerve fibres.

When a number of balls are suspended in a row touching each other, and a tap be given to one at the outside, it is the ball at the other end which flies from its place: the impetus has been transmitted from one to the other till at last the transmission becomes impossible, and the impetus drives the outside ball from its place. So the waves of nerve perturbation started in the ovary may terminate, for instance, in the peripheral fibrils of an intercostal nerve, and are felt by the patient as gusts of neuralgic pain. Or they may extend to the stomach, and cause vomiting. The range of such ovarian disturbance is as follows, so far as my experience goes. The occipital lobes are affected, as is commonly the case with pelvic trouble (p. 121), and the patient feels depressed and is disposed to cry; while there is vertical headache. There is intercostal pain with the three tender spots of Valleix: one at the left apex, the most marked one; a second at the outer edge of the scapula; and the other at the point of ingress of the posterior sensory root at the spinal foramen. There may be palpitation; less commonly, some depression of the heart's action. There is constipation reflexly produced (p. 121); while the patient is liable to paroxysms of irritation, or dryness and itching of the anus; or even of the vagina as well, in some cases. The uterus and its appendages are kept in a state of high vascularity; while orgasm is frequent, especially during sleep, 'the period *par excellence* of reflex excitability.' Frequently the bladder centres become implicated, and the patient is unable to hold her water. Thus we see a distinct grouping of symptoms quite intelligible. When the ovary lies to the side (usually the left) it is close to the bowel, and pain accompanies the act of defæcation; when near the mesial line the pain is associated with the act of micturition. Commonly, bearing-down pains are complained of. Such is the *tout-ensemble* of a malady very commonly seen—when the mental eye has learned to see it, with well-marked characters too. But it has not yet made

its way into text-books; or even into a medical curriculum, except the rooms of some of our obstetric physicians. Yet the recognition of this many-linked malady will stand the practitioner in good stead many a time and oft; if, that is, he will take the trouble to learn to recognise it. He will not encounter it at the examination table in theory, or find such a case a part of his clinical examination, in all probability: but Dame Nature will bring the case before him frequently enough, as an increasing experience will tell the reader; who perhaps on first reading this feels an impression that the whole is a flight of my imagination—and a lofty flight too!

Here there is great suffering at the menstrual week; indeed, the patient may roll on the floor in agony, just as much as in the obstructive form of dysmenorrhœa. There is much suffering also in the intra-menstrual interval. The treatment of maladies is no part of my present scheme; but the facts are arranged so as to suggest the rational treatment.

Leucorrhœa.—Like all other mucous membranes, that of the vagina and uterus is liable to catarrhal states. A discharge may be due to infection (gonorrhœal); or be a mere blenorragia due to irritation, as coitus, or to a want of habits of cleanliness. Or it may be a flux associated with atonic states of the system. Such 'whites' or 'weakness,' as it is variously termed, is itself very debilitating when excessive. Sometimes such leucorrhœal condition exists during the whole of the interval betwixt the menstrual periods, which may be excessive. At other times the menstrual flux seems lost in the discharge till the periods are not distinguishable at all. Such a blenorragia in woman may set up a urethritis in the male having coitus with her; without any grounds for suspicion of its being gonorrhœal, on either side. A fact not generally known!

It must be borne in mind, however, in all losses bearing on the generative expenditure, that there is a loss of a highly elaborate fluid, whether semen or the secretion of

the female glands (the glands of Naboth or those of Duvernay), or mere mucus; not only that, with much of this there is a great nervous expenditure. And this last it is which exhausts the nervous system. This is seen in persons of abandoned habits in either sex! they seem to have lost all capacity for intellectual pleasure, or indeed corporeal pleasure; except that which is attendant upon the reproductive instinct—their life is reduced to a sensual dream. A condition not confined to lunatic asylums, or even retreats. It is the life of the ape indeed. Imbeciles and idiots resemble the ape in their persistent indulgence of the sexual appetite, in season and out of season. While in others the repression of their instincts seems to blight, or deform the whole character.

CHAPTER IX.

THE TEMPERATURE.

ONE of the most valuable additions to our means of correctly estimating the real condition of a patient is the clinical thermometer. When the 'Treatise on Medical Thermometry,' by Wunderlich, was translated by the Sydenham Society, most of us wakened up to the conviction that a new and important light was thrown upon disease. Of course the matter was not unknown to many before this; but the general awakening of the profession at large to the fact dates from then (1871). The subject is now very thoroughly taught in hospitals; but as possibly some of my readers who entered the ranks of the profession anterior to that time, may like to have a brief *résumé* on this important subject; it seems desirable to add such. The attempt will be made to so arrange the matter as to enable the practitioner to think rationally over his observations. A medical man is something more than 'a mere sense-machine for registering observations,' as Maudsley pithily puts it. Unless he do reflect thoughtfully, he will lose much of the advantage he may gain from the little instrument.

In the first place, he must realize that many maladies do not affect the temperature; while others do. All febrile and inflammatory affections produce a rise of temperature; while others, like diarrhœa or asthma, decrease the body-temperature. When hæmorrhage from the bowels is taking place in

typhoid fever, the temperature suddenly drops; consequently a sudden fall in the temperature in enteric fever puts the medical man upon his guard as to this accident, without waiting to see blood appear per anum. On the other hand, when in a pyretic affection the temperature suddenly runs very high—over 105° Fahr.—then a condition of hyperpyrexia is setting in; which will probably be quickly fatal.

The time consumed for a thermometric examination should not be less than five minutes. Consequently it is very evident that very busy practitioners must limit their thermometric observations in many instances. It is in the full conviction that this is inevitable that I have urged before (p. 57) the use of the watch in order to tell more quickly what is probably going on. Fifty years ago, the pulse was invariably carefully counted; and a rise or fall was regarded as of much import. Such an observation can be taken fairly in half a minute. If each practitioner in his early days of practice, before he becomes a busy man, would learn to note the relation between what the watch tells and what the thermometer has to say, he would find it of infinite service to him when the demands upon his time become numerous. The watch might be found often to tell him that the thermometer should be used; sometimes, doubtless, that it may be dispensed with.* But it may be pleaded the pulse varies so much with excitement or nervousness. Certainly; but is this not equally true as to the temperature? Some time ago, a case came under my notice where Dr. Green, of Sandown, I.W., had found the temperature always at least 103° Fahr. when taken.

* 'In surgery, as in physic, with a high temperature, we have, as a rule, a correspondingly rapid pulse and respiration. In health the proportion borne between pulse and respiration is stated generally at 4 to 1 in the adult; this proportion is not materially influenced by disease, except, contrary to what one would suppose, in low temperatures.'—McFIE CAMPBELL.

Yet there was nothing in the progress of the case to warrant such a temperature, which went on for months. (See chap. xii., on the effects of high temperatures.) The patient was a girl of highly neurosal temperament—indeed, just one of those beings who seem made to mislead doctors. Having occasion to visit her at her home, she was found comfortably seated in an arm-chair, dressed, looking very nicely, in high spirits, with some excitement perhaps. On taking her temperature, it was found to be no less than 104° . Taken in connection with what Dr. Green had observed, it was clear this was a passing neurosal temperature. The case, indeed, was one of malnutrition; where, according to all known laws, there should have been a sub-normal temperature, not a high one. There was a corresponding acceleration of the respiration and the pulse. Now, if the watch was not to be relied on here, neither was the clinical thermometer. Nor is such case an isolated one. It merely proves that with all instruments of precision thought is requisite. ‘It is not the instrument that knows,’ is the remark of one of the soundest old practitioners with whom the writer is acquainted.

As the reader may think that such a case is too uncommon to carry with it any practical significance, it may be well to see what Austin Flint says, as no one will be venturesome enough to doubt his statements: ‘The physician is liable to be misled by placing too much reliance on the laws of temperature. They are not infrequently interfered with by complications and accidental events. As an illustration, a young girl had passed through typhoid fever, convalescence being declared, in connection with other symptoms, by the laws of thermometry belonging to the decline of fever or defervescence in this disease. Suddenly, hysterical symptoms were manifested, and the temperature rose to 105° . The physician, a man of learning and large experience, was naturally alarmed. In a few hours, however, the temperature declined, and recovery took place without further

impediment. The expressive comment made by the physician was, "This is not the first time I have been fooled by temperature." With regard to the information furnished by the thermometer, as well as to other diagnostic symptoms, it is to be borne in mind that there are exceptions to rules which are generally applicable. When then the temperature is found to be higher than other evidences seem to warrant, the case requires thought. If found in a young woman of the hysterical type, it is probably a neurosis. Under other circumstances it may mean no more than acute indigestion, a very common cause of a sharp rise of temperature. While at other times it is an hyperpyrexia, gravely threatening life. It is expecting too much of an instrument to suppose for a moment that it could give any suggestion as to what the relations of the sudden rise are. The brain of him that wields it might, however, solve the problem!

It is well, therefore, to have some definite ideas as to the relation of the body-temperature to certain states. Rosenthal has divided the body into two areas, (1) the internal, or 'heat-making' area; and (2) the external, or 'heat-losing' area. In cold weather the cutaneous vessels are contracted, and the surface is marbly, by which the heat-loss is reduced to a minimum. At the same time there is high vascularity in the internal area with consequent increased heat-production. Such is the mode by which the body-temperature is maintained in cold. Clothes lessen the heat-loss, and the Eskimo is clad in furs. In hot weather the skin is highly vascular, and the cutaneous area is full of blood; consequently there is great heat-loss. The external area being full of blood, the internal area is correspondingly depleted; and therewith heat-production is lessened. Further, the vascular skin increases the perspiration, and then the cooling effects of the evaporation of water are added. That is, there is diminished heat-production with increased heat-loss, so as to keep the body cool. In the tropics the natives wear

little more than a breech-clout ; for decency, not warmth ! The effects of perspiration on the heat-loss must be borne in mind ; and then the practitioner will never underestimate the significance of a high temperature with a moist skin. A moist skin with pyrexia means a heat-loss much beyond what is normal ; yet there is still pyrexia, and consequently the heat-production must be enormous.

Pyrexia may be due to diminished heat-loss, or increased heat-production, or both. In the rising fever of the exanthemata, and other febrile conditions, the perspiration is almost nil ; and the fever is due mainly to defective heat-loss. In rheumatic fever the skin is usually moist, or even wet ; and yet the temperature is above the normal. Here heat-production must be great. (The importance of recognising the distinction betwixt a 'dry skin' and a 'wet skin' pyrexia as regards the indications for treatment, is considered fully in the chapter on 'Body-Heat and Fever' in 'The Practitioner's Hand-book of Treatment,' or 'The Principles of Therapeutics,' 2nd ed., 1880.) In estimating the pyrexial rise of temperature the practitioner should never overlook the significance of a 'wet skin,' as compared to a 'dry skin.' Without such consideration his mere observation of the actual body-temperature is imperfect.

Pyrexia then may be due to

1. Imperfect heat-loss.
2. Increased heat-production.
3. Both combined.

Beyond this there is the condition where the heat-loss is larger than is normal ; yet, nevertheless, the heat-production is still farther in excess over what is normal. This last tells of a far graver condition than the dry skin of rising fever.

Then there are other relations of pyrexia to remember. In children the temperature is mobile, and a rise is readily produced. While as age goes on this mobility decreases, and a rise of temperature in old persons is gravely

significant. A rise of two or three degrees in a child is of little moment; in a person over sixty it is decidedly ominous.

Then there is the rapidity of the rise. In acute indigestion the rise is swift to 103° or 104° , or even 105° ; and the defervescence equally rapid. In fevers the rise is attained much more slowly, taking as many days, as a rule, as indigestion takes hours; while the defervescence is proportionately slow. A very sharp rise from a condition of health is very suggestive of acute indigestion; though it may mean insolation. Sunstroke is seen even in England; but only in our hottest weather, and in those exposed to the sun, as field-hands. A person with an ill-developed nervous system, or depressed from any cause, mental or bodily, is much more liable to a rapid temperature-disturbance from sunstroke than others with more resistant nervous systems.

The normal temperature of the body may be stated to be from 98.5° to 99° Fahrenheit. A variation of several degrees upwards to 101° is not incompatible with health. If the individual be ill, then the rise to 101° , or even less, may be a distinct febrile temperature. A fall to 97° , or more, may occur from vomiting, or diarrhoea, without its being classed as an abnormal temperature.

But when the temperature rises persistently over 99.5° it is called 'febrile, but low.' When 101° is reached it is 'febrile'; when 102° is reached the temperature is called 'high'; when 104° is reached it is 'very high'; and beyond 105° it reaches 'hyperpyrexia,' and life is in danger; increasing with every degree up to 108° , which may be regarded as 'the limit compatible with recovery;' though a few carefully observed trustworthy cases are on record of a recovery from a temperature of 110° . The notorious Scarborough case when for seven weeks the temperature ranged from 108° to 110° , at one time reaching 122° , was, in every way, too queer a case to have any scientific value.

Then when the temperature falls below 96° it is termed a

'collapse' temperature; and below 93° there is 'algide collapse.'

Collapse.—This varies from the subnormal temperature found with asthma, emphysema, cardiac lesions, and some forms of insanity, to the coma of alcohol; where the late Bathurst Woodman found a temperature of 90° compatible with recovery, in several instances at the London Hospital. It may be brought about from diarrhoea, vomiting, or hæmorrhage; and consists of a sharp fall below the normal, there often being something of a rise after the sharp fall. At other times the collapse occurs during a pyrexial condition, as seen in the accompanying diagram.*

Such a sudden fall in enteric fever would indicate hæmorrhage in the bowel. A sharp fall may follow the cold bath.



The ingestion of cold fluids will lower the temperature a degree or two for a brief time.

Now in estimating the significance of a subnormal temperature the circumstances have to be considered. In diseases of inanition the temperature falls, and the danger lies in its falling below the point compatible with life. Then in acute collapse there is danger in proportion to the

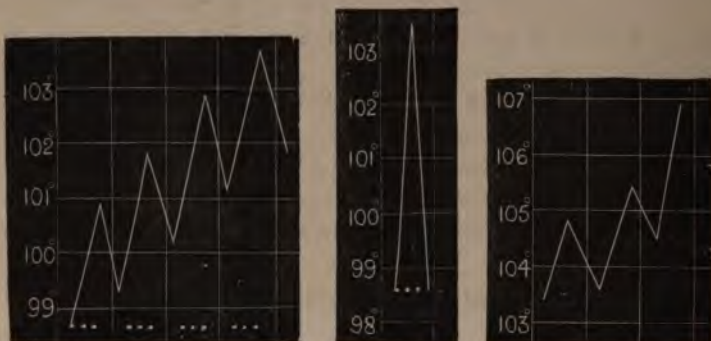
*All the charts not otherwise indicated are taken from Wunderlich's work; translated by the New Sydenham Society, and I have to thank the Honorary Secretary, Mr. Jonathan Hutchinson, for his permission to make use of them.

amount of fall, and the circumstances attending it. One matter, to my mind, too little attended to in narcotic poisoning, is the fall of temperature produced by the palsyng effect of the toxic agent upon the respiration and the circulation, diminishing the chemical interchanges. The effect of the drug is intensified by the lowering of the temperature; until a point is reached when the palsied centres cease to act altogether.

There are times when one fears collapse in disease, and finds a crumb of comfort in the temperature keeping high. 'Well, the temperature keeps up,' is the remark not uncommonly heard. A fall coming on in a person whose powers are weakened is justly dreaded, especially in thoracic disease.

Pyrexia.—Rises of temperature are far more frequently met with than subnormal temperatures; at least in circumstances where the thermometer is an important witness. All febrile affections, all inflammatory affections, entail a rise of temperature. 'A temperature, therefore, below the maximum of healthy variation is sufficient to exclude all febrile and acute inflammatory diseases.'—(Flint.) Tetanus involving great muscular action entails a high temperature, even over 110° at times. Rheumatic fever is liable to give rise to hyperpyrexia, running up from 106° to 111° . Scarlatina and relapsing, or famine fever, both give high temperatures; the first not uncommonly reaches 104° or 105° , while the latter may touch 107° , yet death from relapsing fever is not particularly common. A steady upward rise from a 'high' to a 'very high' temperature cannot be regarded without grave anxiety. A point to be noticed, a matter most marked, and yet one for which no satisfactory explanation has yet been tendered, is 'the morning fall,' with 'the evening rise.' This diurnal oscillation is more or less pronounced in all cases; in some it is very marked, as in softening tubercle, for instance; while in the varioloid tracing the difference is comparatively slight. Sometimes

the temperature rises up to death, as in the case of fatal small-pox given further on. In phthisis 'it is seldom death occurs with a persistently rising temperature, in immediate sequence to the previous fever.'—(Wunderlich.)

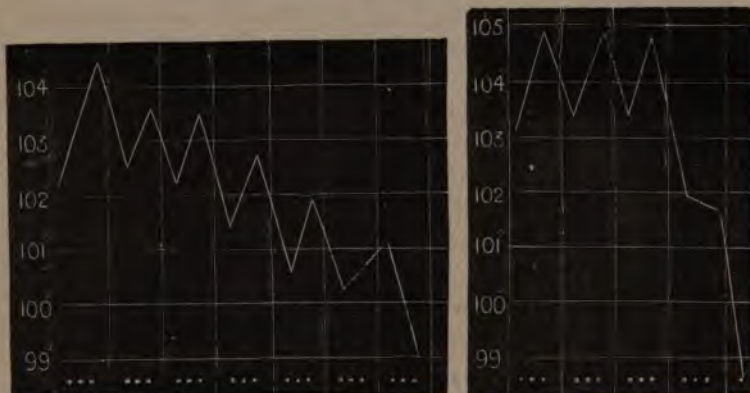


In acute specific pyrexia the temperature not unfrequently rises till death arrests it. The following tracings indicate the rise of pyrexia. The first gives a gradual rise, as is met with in many conditions of moderately acute pyrexia. The second gives the sharp rise of *ague*. This might also stand for the quick rise of acute indigestion. While the third gives a pyrexia shooting up into a hyperpyrexia, where a serious condition is passing into one of imminent danger to life.* There is then a gradual rise, and a sharp rise.

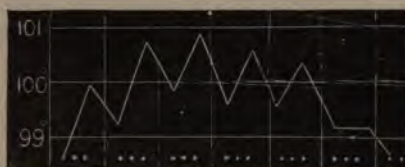
In the same way defervescence comes about: there is the gradual fall (*lysis*) seen in the first tracing, while the rapid fall (*crisis*) is depicted in the second. The third tracing represents the pyrexial curve of an ordinary febrile condition as one of the *exanthems*, for instance (though each has its own temperature outline, as seen further on);

* The rise may continue for some time after death, as in yellow fever, where a temperature of 110° is not uncommon an hour or two after death.

while in enteric fever the curve is extended over four times as long a period. It is well to familiarise the eye



with typical tracings, as by so doing any deviation therefrom is all the more readily marked. Of course cases vary.



i.e., present individual variations; still there are broad rules worth remembering. Wunderlich gives some in these words:

‘In small-pox the fastigium (the pyrexial rise) ends as soon as the eruption becomes “shotty.” In measles it terminates when the eruption is at its height. In scarlatina when the exanthem begins to pale. In pneumonia when the hepatization is completed, seldom before the third, or after the ninth day. In true petechial typhus towards the end of the second week, sometimes in the middle of the third week. In abdominal typhus, or enteric fever, in

mild cases in the middle or at the end of the second week ; in severe cases in the middle or at the end of the third week, and sometimes not till the fourth week. In influenza it generally ends after a few days. In parenchymatous tonsillar angina after lasting from three to seven days.'

Before proceeding to give some more special temperature curves, a few words may be said as to some points to be observed in medical thermometry, which may prevent an erroneous reading of the thermometrical observations. And the following observation by Wunderlich is worthy of careful thought :

'When one studies the rules which may be deduced from the comparison of separate cases, one never feels quite satisfied, although they may be derived from one's own extended experience. These rules, however cautiously they may be drawn from a great number of separate observations, are never complete, exhaustive, or exact expressions of the facts. All the faults of empirical abstractions are common to them ; they fail to bear the stamp of inevitability, and fresh experiences of another kind may probably modify, and possibly overthrow them.'

The temperature will show individuality in most cases ; just as each case has its own features in other respects. Consequently typical temperature-curves can never be more than at least partly schematic. Wunderlich sees this, for he states : 'In order to extract the general facts from separate observations, we must look less to the *numbers* than the *form*, that is, to the varied outline of the wave-systems, which each separate curve furnishes us. Only in this way are we able to construct a sort of model curve, which may approximatively express the peculiarities of single cases.' The reader, then, must study the general outline of the different curves of various pyrexiaë, as part of the natural history of the disease. And here the reader must excuse an interpolation. In the writer's experience, the

clearest-headed practitioners have been those who studied disease as a naturalist studies a group of plants or animals; and then a species, with its variations. So in medicine there are groups of diseases like malnutrition in its various forms, and pyrexia, for instance; and the first step is to get up the outlines of each group; next, the features of each malady; after which the individual peculiarities are easily recognised. The study of the natural history of a disease includes its temperature curve, if it has one. Familiarity with the outline of the disease will enable the detection of any singularity to be readily made; and what is more, makes its explanation readily apparent, at least in most cases.

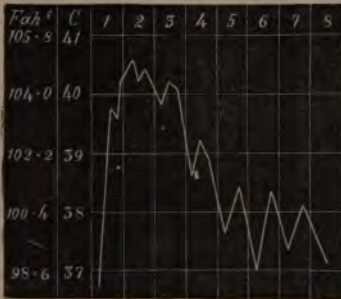
Then, again, there are associations of temperature-variations to be taken into account, and ranged alongside the evidence of the thermometer. Thus, as Senator points out, there can be no evaporation of water demonstrated in rising fever. While in defervescence there is well-marked perspiration and exhalation of water, by which the heat-loss is made very considerable. Consequently, if the temperature show a fall (and this is not due to an imperfect observation, for that is always the point to be sure about when the temperature is below what might be anticipated) in a pyrexial case, and there be no perspiration, the question arises at once, Is this 'defervescence?' or is there something else in action? In other words, the instrument must be wielded intelligently, like the stethoscope. Some men hear something distinctly, but what its pathological correlative is they cannot tell; the same men look at the index of their thermometer in a vague way, and either can form no conclusion therefrom, or jump to some conclusion by no means necessarily a correct one. Some men are always making observations: but they never make deductions at all commensurate with their observations, either as to the case in connection with which they are made; or anything else. It is easy to make an observation with an instrument of precision, but

individual thought, the sweat of the brow, is indispensable to correct interpretation of it when made.

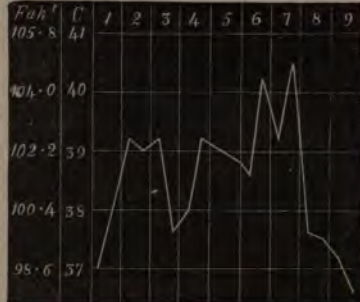
Whenever there is a high temperature steadily maintained, there will be found either a febrile condition with its own features and complications; or a local cause with its special characteristics—at least, as a general rule. In women there are, however, ‘hysterical temperatures;’ or there are pyrexial storms corresponding to the catamenial periods, if carefully hunted out. In one case a sharp pyrexia came on in a lady a month after her confinement, and ran on to the production of the typhoid condition; without any apparent cause. When pressed to give it a name, the old expression, ‘nervous fever,’ was all that could be said. The patient recovered under anti-pyretic measures, but at the end of three weeks the temperature rose again. On careful examination, it was found these ‘pyrexial storms’ corresponded to the times of the catamenial weeks; had impregnation not occurred. The careful practitioner, when puzzled with a pyrexia in a woman during the child-bearing period, should never forget the catamenial week of the mensual cycle; this may not only prevent his making a blunder, but may secure him no little credit.

Thermometrical observations are not free from sources of fallacy, and may mislead unless these observations are corrected by other observations. The finer the instrument of precision, the more knowledge is requisite to wield it wisely; and the wider the diagnostic grasp, the more valuable will each precise observation become. Clinical observations are to be read as Opie mixed his colours—‘with brains, sir!’ For instance, there exists a consolidation of a lung-apex, with a moist râle in the middle of it; this may be a local bronchial râle, or it may indicate softening. The evening temperature will commonly decide the question: and a very important matter this often is. Again, the thermometer will tell of rising pyrexia, even despite energetic, wise

treatment; and its voice is then that of a prophet, albeit a prophet of evil. At other times, it is the herald of good news—of commencing defervescence. The clinical thermometer and the watch are instruments of precision of price-



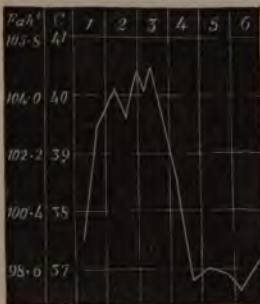
Mild Scarlatina.



Measles.

less value; yet, be it remembered, it is physiological disturbance which gives them their value!

Having thoroughly comprehended what has been written about temperature-curves—viz., that a typical curve can



Varioloid.



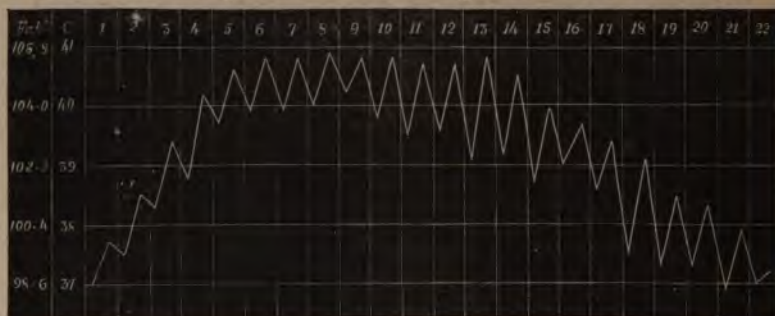
Fatal Small-pox.

only possess a general outline—it may be well to consider the temperature-curve of some common maladies. For instance, compare the curve of ordinary scarlatina with that of measles. The highest point is reached early in the

pyrexia in scarlatina, while in measles it comes just before the defervescence.

Then the curve of varioloid contrasts with the tracing of small-pox, terminating fatally with a sharp pyrexial rise.

Then, again, the long curve of a typical ordinary case of enteric fever presents a character quite unlike the tracings



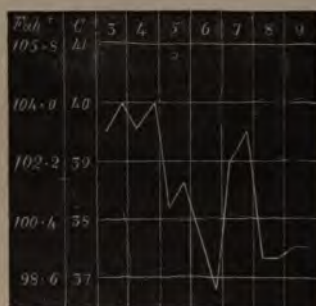
Enteric Fever.

of the temperature in relapsing, or famine fever. The one is a long, flat curve, while the other has a broken, crag-like outline.



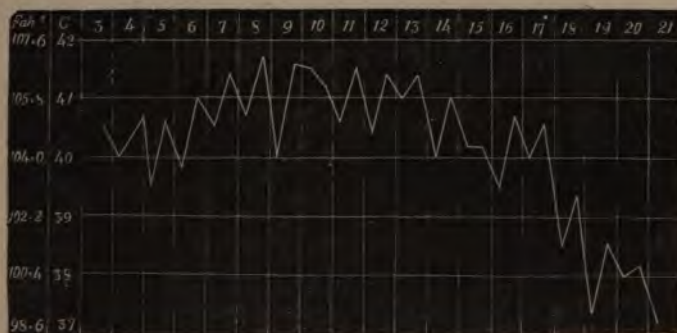
Relapsing Fever.

Relapsing fever is a sharp, sudden pyrexia. Still, when a relapse occurs in case of typhoid fever, the curve of the relapse is so much like that of relapsing fever, that it is unnecessary to give it here.



Erysipelas.

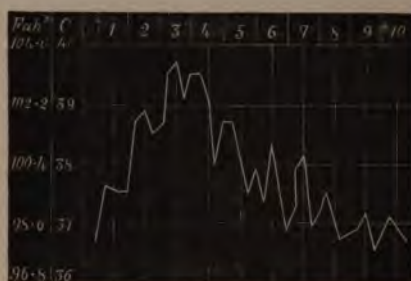
Of like character as brief but sharp pyrexia is the tracing of erysipelas, contrasting with the curve of severe typhus fever.



Typhus.

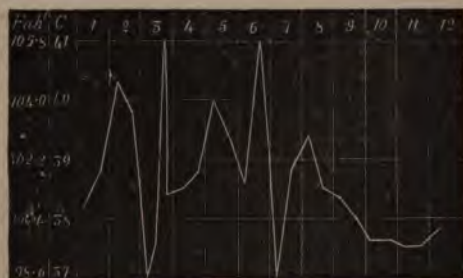
The curves of typhus and of enteric, or typhoid fever tell of an illness which involves a considerable time; though in some cases the fever is cut short, or in other words 'aborts,' and then the tracing approaches the short curve given at p. 167.

Typical uncomplicated pneumonia gives something of this kind



Pneumonia.

Pyæmia gives a tracing much as follows. Of course, cases differ; but pyæmia, as ordinarily seen, gives a comparatively low pyrexial temperature, as a rule, with sharp rises corresponding to rigors.



Pyæmia with Rigors.

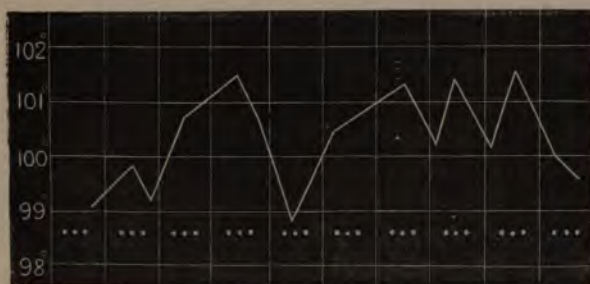
The next tracing is that of the late French statesman, M. Léon Gambetta. His wound-temperature never rose over 101°, and the tracing, given here, commences with the sharp rise, which accompanied the development of the abscess at the ilio-cæcal valve, which revealed itself after his wound in the wrist had healed and he had been out

of doors again. The falls correspond to full doses of quinine.



Gambetta's tracing.

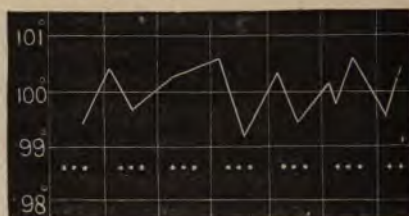
The following tracing was taken by Mr. Waller, from an empyema with pus discharging through the lung, at Victoria Park Hospital.



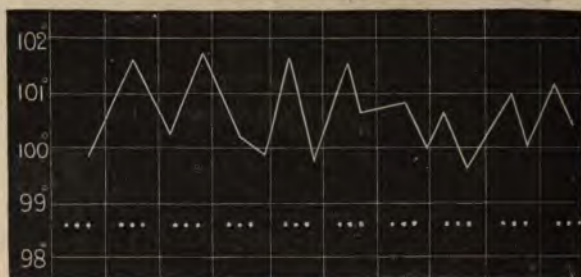
Empyema.

The following two tracings were taken from two cases in my wards at Victoria Park Hospital. They both indicate softening tubercle: the upper one is from a case where the result is doubtful; but from the family history it is probable the case will ultimately succumb. While the latter is taken from a case with the worst prognosis; but which made a temporary rally, under treatment, and left the

hospital, without furnishing an opportunity of seeing the actual condition of the lung.



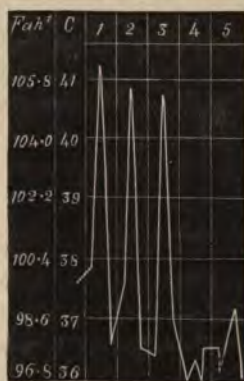
Softening Tubercle.



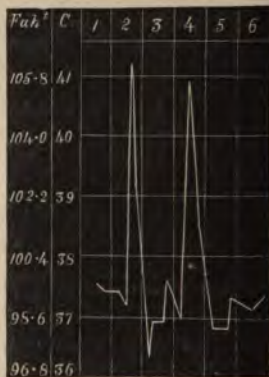
Softening Tubercle.

With these the reader may contrast a tracing of galloping consumption—acute miliary tuberculosis.

The concluding tracings are those of the different forms of intermittent fever: quotidian, tertian, and quartan.

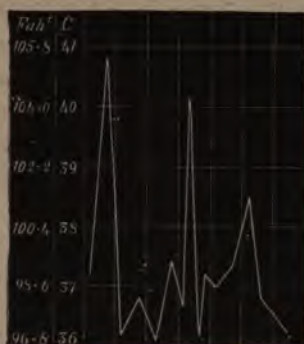


Quotidian (Ague).



Tertian (Ague).

In placing these temperature tracings before the reader, the writer disclaims anything pretending to a comprehensive



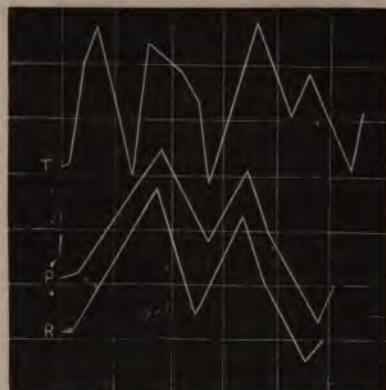
Quartan (Ague).

handling of the matter of temperature-fluctuations. What is given here is merely a bird's-eye view of the subject; with some of the prominent points thrown up in outline. Nothing more! The subject is yet only in its infancy; and every observer will have to trust largely to his own experience. But what has been placed before him here may be a guide to him in casting his experience into some permanent concrete shape. It will help him (it is hoped) to systematise his observations; at least to some extent. If he be familiar with the work of Wunderlich, he will gain little from this chapter. But for the bulk of practitioners this chapter will be as instructive as any other in the treatise, whatever its value may be!

The subject of thermometry must not be made to stand alone from other functional disturbances of the body, as the respiration and the circulation; nor yet to be held out of proportion to these equally important matters. If the young practitioner will study the three together, compare them, and note their parallelism, or the want of it, in various maladies, he will come, as Dr. Campbell and others have, to see that when observations of two of the three have been taken, the third can usually be fairly calculated. Time

becomes an object as practice increases, and the systematic use of watch and thermometer together would soon teach the lesson of when the latter may be dispensed with; and, what is even more, when a thermometrical observation is urgently required. This systematised use of instruments of precision would be far more valuable to patient and practitioner alike, than a random resort to the thermometer, and a guess at the meaning of what it records.

The accompanying diagram is taken from a portion of a case of enteric fever, in which Wunderlich had the temperature, the pulse, and the respiration all carefully taken. The



portion here given represents a somewhat sharp pyrexial rise occurring in the course of a mild case of typhoid or enteric fever. It will serve the purpose of demonstrating that there is a general parallelism betwixt the three. The thermometer, however, gives a more broken outline than the other two. Still, there is enough of resemblance to justify what has just been stated, that when two out of the three factors are taken, the third can usually be fairly calculated. Nothing more is claimed than that a busy man, who has carefully observed when he had the time, may often tell in later days when he may fairly dispense with a thermometri-

cal observation, as, also, when it is desirable to take one : when he has no longer time to spare.

The practical utility, to my mind, of familiarising the eye with the various curves of different pyrexial maladies commonly encountered in practice, lies mainly in this :

If familiar with the typical curve of the malady before him, the practitioner is at once on the alert if the thermometer indicates any modification or variation therefrom : he at once looks out for the cause. If he had no preconceived opinion on the subject, for anything he can know, the modification may be quite normal, *i.e.* so far as a pathological condition has a norm. The study of the natural history of disease is, however, making great strides towards the establishment of such norms, which, making proper allowances of individualities in each case, may be accepted for practical work. Each disease has its features, as each race of men have their characteristics, as the European differs from the Mongol. While European races have certain distinguishing features, as the Latin, the Teuton, and the Slav, who differ from the Hun (who is a Mongol). We can at once distinguish a typical German from an Italian ; and so it is, or perhaps rather ought to be with disease and its differentiation, *viz.*, that each possesses its own temperature curves, just as much as any other feature it may possess. It is by such grouping of phenomena we distinguish one from another ; and in this grouping the pyrexial curve is an important factor.

The oncome of a specific fever is usually marked by great muscular lassitude, the feeling being as if the body had suddenly doubled in weight, as well as by shivering fits. To what the muscular lassitude is due is as yet unknown ; but when a high temperature is maintained continuously for some days the muscular fibrillæ undergo an acute fatty degeneration.

CHAPTER X.

MOTOR AND SENSORY DISORDERS.

[IN this chapter the text-book of Dr. James Ross, 'The Diseases of the Nervous System,' is followed, being the most recent and complete. As much condensation, with extracts, is necessary, this chapter has been submitted to Dr. Ross, in order that he might supervise it; which he has kindly done. All quotations not marked otherwise are taken from his book.]

The brain being enclosed in a firm bony case, it is all but impossible to examine it physically, as we can the thorax; consequently we trust to physiological indications, of which the nervous system admirably admits by its function. From modifications of motion and sensation we learn much as to the area of the brain which is the seat of disease, *i.e.*, if the disease be central. The observations of Fritsch and Hitzig, carried out and amplified by Ferrier, have mapped out the cerebral hemispheres into areas, which were before a *terra incognita* simply—Marshall Hall ascending to the medulla oblongata, but no further. Now we know that there is an anterior perceptive area; a central motor band; and posterior lobes, which are related to the viscera and our subjective sensories. (The recent discoveries of scientific observers show how wonderfully the observations of Gall and Spurzheim approached the facts—there being a clear, if only broad, resemblance betwixt their views and those of recent observers. The comparison is about this: the phreno-

logical map is to the real map like the fantastic shapes in shadowy outline seen in fog, of a mass of mountain with crag and ravine, grassy slopes and tumbling rivulets, when clearly seen. The highly localised differentiations of the phrenologists brought the whole scheme into disrepute.)

An injury to the cortex of the brain will give a corresponding disturbance by which it can be recognised if it occur in either the motor or sensory area ; but not, in the present state of our knowledge, if located elsewhere. [Of course, the modern student is familiar with recent brain-investigations, while older men perhaps are not. If, therefore, any of the first feel insulted by my generalisations here, they will perhaps accept the explanation just given, in extenuation of my offence.] A loss, more or less complete, of motion or sensation, or an abnormal form of either, will result from an injury, or morbid change in the corresponding cortical area of the cerebral hemispheres. But the modification may be due to some change at the periphery, or to something affecting the nerve-fibrils in their course, and consequently not be central. For instance, the facial nerve is apt to be paralysed (Bell's paralysis). It may be paralysed on one side, at other times on both. This may be due to central causes, and be a part of an extended cerebral lesion. Or it may be due to pressure on the nerve tract in the bony channel in which it runs; or from the many organs liable to morbid growth near which it passes. Or it may be purely superficial, from exposure to cold: the rheumatic paralysis, 'probably due to a slight neuritis, followed by serous or plastic exudation into the sheath of the nerves, which compresses the nerve fibrils.' And what is found in the seventh facial nerve may occur with any other nerve.

Then the oncome of this special-nerve, or individual paralysis may have various relations, which throw light upon its significance. 'The onset of facial paralysis differs according to its cause. It appears suddenly when it results from traumatic lesion of the nerve ; and when it is caused

by exposure to cold, the patient is usually surprised to find one side of his face paralysed in the morning. When paralysis results from disease which invades the nerve secondarily, either by gradual compression or by altering its texture, the paralytic symptoms become slowly and gradually developed, and spread from branch to branch of the nerve. Premonitory symptoms may be experienced for some days before the appearance of the paralysis; these consist of pain on the side of the face which is subsequently paralysed, noises in the ear, deafness, and abnormal sensations of taste on the same side.' In the latter case, there are evidences given of coming mischief, which are absent when the paralysis is traumatic or rheumatic; or when it is part of a wider injury from apoplexy, embolism, or effusion. The paralysed side is smooth, unwrinkled, and expressionless. The patient cannot close the eyelid; if Horner's muscle be involved, the tears run down the cheek instead of into the lachrymal canal; the buccinator muscle flaps like a loose sail in speaking or in any expiratory action; the saliva dribbles down the palsied side, which falls to a lower level than the sound side. At the same time the sense of hearing may be preternaturally acute.

The observation of a mere paralysis, no matter whether highly localised or extensive, is in itself insufficient to throw much light on a case without investigation as to the cause of the said paralysis; which latter involves both further observation and reflection. It may not be nervous at all, but be due to other causes. Loss of motor power in a limb may be due to osseous changes which prevent motion, or less commonly to wasting of muscles. Make sure, then, first that it is nervous in its causation; then see if there is any cause connected with the nerve-trunk. Hughlings Jackson says it is not uncommon to find a patient at the London Hospital who has 'lost the use of his arm,' having fallen asleep with the arm over a chair—when drunk, of course.

Then, if it be probably central, see what its relations are.

A girl with chorea is often described by her mother as having 'lost the use of her arm,' there being actually a considerable loss of power.

Lessened Motor Power.—Diminution, or loss of motor power from central causes has highly interesting relations. Hemiplegia may result from rupture of an artery ploughing up one or other hemisphere. If on the left side, there is impairment of speech from Broca's convolution being injured or compressed. This is a common form of paralysis, 'right side paralysis with impaired speech.' Here the speech is affected by the muscles of the mouth, etc., being paralysed from an injury to their motor centres; the motor centres for the muscles of articulation and those by means of which the special movements of the hand are executed being regionally near each other. When Broca's convolution is implicated, then another phenomenon is manifested; the patient becomes aphasic, that is, he cannot find the word he desires, and either fails to find the word, or a word, or more commonly uses a wrong word. This is quite distinct from impaired articulation due to paralysis of the muscles involved in speech, from injury to their cerebral centres. Inability to find the word he wants is 'amnesic aphasia;' and the lesion is in the angular gyrus and superior temporo-sphenoidal convolution. Inability to articulate the word—to give outward expression to intellectual states by words written or spoken, or by pantomime, is complete ataxic aphasia, and the lesion is in Broca's convolution. To those who feel curious on this matter, Dr. Ross's book will give them much highly interesting information. A man may be 'speechless' but not 'wordless;' he may be unable to find the word he wishes (amnesic aphasia), or uses a wrong word having an association of idea, as 'worm powder' for 'cough medicine,' or an association of sound, as 'parasol' for 'castor oil' (Hughlings Jackson). Where the word-centre, located in Broca's convolution, is involved, the power of articulation is affected; which commonly

occurs when the motor centres near the fissure of Rolando are the seat, or part of the seat of the lesion. (It is impossible, however, here to follow out the subject of the precise cerebral lesion which occurs with the different paralyses. Those who have been privileged to witness Dr. Ferrier's observations know how entrancing they were and are, and how accurate they are also; but the matter cannot be discussed here. The allusions must be of a general character.)

The first point to notice is any loss of expression about the face—any smoothing out of wrinkles, any obliteration of furrows, any muffling of the speech. Then follows 'ptosis,' that is, a falling of the eyelid. Its interest lies in the fact that the eyelid is supplied by a branch of the third nerve. The opposite condition of inability to close the eye is linked with paralysis of the seventh nerve.

Then 'strabismus' may be 'convergent' or 'divergent,' according as the external or internal rectus muscle is affected. A squint when permanent has no significance; when a person is observed to begin to squint at intervals, then serious brain-mischief is probably going on; when a child is noticed to squint at times, this is of the worst omen, as indicating in all probability tubercular meningitis ('water on the head'). It may, however, be due to the irritation of teething. As with other nerves, the cause of the impaired motion may be a purely local one, as cold, pressure on the nerve-trunk in its curve; or be a central lesion; or be reflex. Injuries, growths, osseous, syphilitic, or other, extravasations of blood, or other fluid, are the common causes of disturbance of the ocular muscles; while diphtheria may leave behind all sorts of forms of paralysis.

The pupil is affected by various conditions about which it is not possible to write precisely. Some facts are generally recognised, as the contraction produced by opium, or the dilatation produced by belladonna; and observation of the pupils will often give the most valuable information, and

enable the medical man to put a pertinent question, very much to the patient's surprise. The pupils are irregular in the general paralysis of the insane. Then the pupil is affected by light, increasing in size at night and decreasing in the day. The mobility of the iris is interfered with by many and varying cerebral conditions; consequently in conditions of coma and insensibility the conduct of the iris to light is often very instructive. Whenever the lenticular ganglion is interfered with, then disturbance follows in the muscular fibres of the iris. The behaviour of the pupil must be taken into consideration along with other phenomena. I wish it were possible to lay down some definite rules about the indications given by the behaviour of the pupils; but as writers of treatises on the nervous system and its diseases, have not been able to do this, it is clear it is not in my power to do it. Charlton Bastian says: 'When the condition of coma with general paralysis has become established as the result of an extensive lesion in the pons varolii (whether this lesion be primary or secondary) the condition itself is very apt to be associated with contracted and motionless pupils, as in opium-poisoning, whereas in cases of ventricular hæmorrhage the pupils are usually dilated. The diagnostic indications afforded by the condition of the pupils in brain diseases are only too often vague and indefinite, though the relations above stated, from their comparative uniformity, afford important exceptions to this general rule.'

If this be the opinion about the pupil in cerebral lesions, my experience with belladonna, which is by no means limited, tells me that the relations of belladonna, taken internally, to the pupil are far too uncertain to be of any practical value. Certainly in rare cases the pupil is dilated, and only in rare cases. Just as, at times, a 'pin-point' pupil will enable one to assert with confidence that the patient has been taking opium; maybe only in a cough lozenge.

Then the nose may be drawn to the healthy side, while the nostril of the paralysed side 'instead of expanding during inspiration falls in.'

The mouth in facial paralysis is drawn to the healthy side of the face, 'and the distortion becomes more pronounced during all mimetic movements, as in crying, laughing, and speaking.' Sometimes a trifling immobility about one side of the mouth will tell of a syphilitic history; sometimes the mouth is alone (apparently) affected, and there is an impression abroad that such slight local palsy is significant of worse to come; sometimes such impairment of symmetry, for it amounts to little more, may tell of a by-past stroke, while more often the remaining lesion is somewhat more pronounced; and in other cases some 'drawing of the mouth aside' has been occasionally seen in women without anything further happening. It is always well to note the features of every patient, and if any abnormality, any disturbance of mobility be observed, to hunt it down, and make its relations clear.

The tongue is often seen to turn to one side when 'put out,' viz., the paralysed side; the healthy side pushing the other away. While 'the various movements of the tongue can only be imperfectly or not at all performed on the affected side.' Such is the evidence of the tongue in hemiplegia. 'When the paralysis is double and complete, the tongue lies immovable on the floor of the cavity of the mouth; it is relaxed, often atrophied, with its surface wrinkled, and frequently presenting slight fibrillary contractions of its surface. If the paralysis is incomplete, the tongue can be protruded, but complicated movements, such as raising the tip to the roof of the mouth, or rolling the tongue into a tubular form, are impossible.' As to the relations of lingual palsy, 'unilateral paralysis of the tongue in association with hemiplegia indicates a cerebral origin; while bilateral paralysis in connection with paralysis of the lips and soft palate indicates a bulbar origin.' Glosso-

pharyngeal paralysis is linked with mischief in the medulla. Lingual spasm is found with several nervous conditions, as hysterical convulsions, chorea, and epilepsy; while fibrillary contractions in the tongue occur in connection with bulbar paralysis with progressive muscular atrophy. When the tongue is implicated singing becomes impossible.

Linked with affections of the tongue come affections of speech. Any palsy of the tongue interferes with utterance; but there are also laryngeal associations of the voice. First in prominence comes hysterical aphonia, a very common affection. Some hysterical patients experience a difficulty in emptying the bladder, but here the discomfort usually soon puts matters right. When 'the voice is lost' there is no such strong motive to correct the inability, and it is allowed to go on. Aphonia in a young woman often creates needless alarm. (It may be due to a cold affecting the mechanism of voice.) Voice and articulation may both be lost in bulbar paralysis. Loss of speech or impairment of it, with loss of memory for words, and other matters of aphonia, with aphasia and amnesia, cannot possibly be considered here, however interesting. For information on details, the reader can consult Dr. Ross's book, or other allied works.

Hemiplegia.—Paralysis of one side in adults is usually due to a lesion in the cerebral hemisphere of the opposite side. It is seen mainly in the limbs of the paralysed side; but in severe cases the inspiratory muscles are implicated for the first few days.

Frequently along with the paralysis there are spasms of the muscles. They are due to irritation set up by inflammatory action around the clot. They are often detected by passive movement, when not obvious. The extent of 'early rigidity' varies. Its onset may occur a few days after the cause of the hemiplegia, while usually it disappears soon; but it may linger. 'The appearance of early rigidity diminishes the patient's chances of recovery, and when it continues for a long time changes take place in the muscles, tendons, and

joints of the affected extremities, which ultimately leave them permanently contracted and useless.'

'Late rigidity' is due to secondary degeneration, or atrophy of the affected motor tracts. Its onset tells that structural changes inimical to the recovery of functional power are going on. It is connected with exaggeration of the reflexes, as the patellar 'tendon-reflex.' The attitudes taken by this rigidity vary considerably in different cases; 'but on the whole they conform to the rule observed in almost all spasmodic affections, namely, that flexion predominates in the upper, and extension in the lower extremity.' In time the muscles waste and all utility of the limb is lost. The bilateral muscles of the trunk suffer little in late rigidity. It is always held that the prospects of recovery of power are better when the leg begins to come round before the arm, than when the opposite is the case. Persons who have had 'a stroke' often can walk fairly well, when the hand remains of little use. When the injured person commences to walk, then the gait becomes modified in a characteristic manner. When the affected limb is being moved the shoulder of the healthy side is thrown outwards, and the hip of the paralysed side raised so as to swing the leg round, the toe commonly trailing on the ground. If the walk of a hemiplegic person be once studied, the movements and their causation are made plain for ever after.

Then the spastic hemiplegia of infants is a distinct malady, with attacks of convulsions, which in time impair the intellect.

Incomplete paralysis, or rather impaired power of one side, is not uncommonly seen with chorea.

Alternate hemiplegia, 'in which the extremities, half the face and half the tongue, are paralysed on the side opposite, and the oculo-motor nerve in the same side as the lesion,' is the characteristic outcome of lesions in the cerebral peduncles. Spinal hemiplegia gives paralysis with hyperæsthesia on

one side ; with anæsthesia of the opposite side ; and frequently the paralysed muscles quickly waste. 'Acute bed-sore may appear on the anæsthetic, and inflammation of the knee-joint on the paralysed side ; while well-marked ataxia may be observed on the return of motor power in the paralysed leg.' When the mischief is high up the upper extremity is involved.

Paraplegia.—This is paralysis of both sides, extending from the lower limbs upwards. It may be due to disease in the cord, syphilitic or other, or to injury. The sphincters are more or less involved, according to the seat of the disease, and its nature and extent. Paraplegia is not uncommon in women as a result of utero-ovarian trouble, and is then called hysterical, or reflex ; and usually the diagnosis is not difficult.

The paraplegia with an inflammatory zone in the cord has spasms, which are absent in spinal anæmia. Consequently spasms with paraplegia point to conditions of actual disease. Paraplegia, more or less complete, is often found in young women along with that group of symptoms called 'spinal irritation.' When paraplegia is due to myelitis the sphincters are affected, and bedsores readily form. (The ready formation of bedsores shows the trophic nerves are injured.) Cervical paraplegia gives a slow pulse and a dilated or contracted pupil, while the arms are involved.

A gradual impairment of the motor power in the lower limbs is seen in elderly men with slowly progressing disease of the brain and cord. The walk degenerates gradually from 'the sure and certain step of man' into a mere shuffle ; and the step is less than the length of the foot.

Reflex paraplegia is also seen at times, and is one consequence of fracture of the coccyx.

In cancer affecting the cord there is usually severe local pain. In that modification of gait known as locomotor

ataxy there are commonly 'lightning pains,' which are very acute.

Gait.—Some general observations may now be made as to the modification of the gait produced by various nervous diseases. Dr. Hughlings Jackson showed me himself the modifications so produced, by imitating them. They run briefly as follows. First comes ordinary hemiplegia :

Hemiplegia.—In hemiplegia the shoulder is tilted to the healthy side so as to raise the pelvis of the affected side, and thus enable the leg to be swung round ; the knee-action being largely abolished. The shoe becomes worn at the toe, as it is trailed on the ground at each step. The arm often hangs down rigid and useless.

Paraplegia.—Here the legs do not step, but trail or shuffle; both of them! While the 'step' is not the length of the shoe in advanced cases.

Hysterical Paralysis.—Here the feet are dragged along, one more marked than the other ; while the patient is apt 'to drop in a lump.' (In true paraplegia the patient does not drop so long as the power of walking remains.)

Paralysis Agitans.—Here the patient trots forward, an exaggeration of the actor's walk when appearing on the stage ; while the shaking hands are held out in front of the body, which is bent forward.

Progressive Muscular Atrophy.—Here the gait is that of the sailor before he has got his 'land-legs,' only exaggerated ; while the muscles of the ball of the thumb are wasted, and if the patient attempt to unbutton his waistcoat, he thrusts at the buttons with the dorsal aspect of his fingers.—Pearson Irvine.

Pseudo-hypertrophic Paralysis.—Here there is a waddle or 'duck-like walk,' not unlike that of *talipes varus*. "Is that the long word you call it when a fellah walks so?" said the young man, making his fists revolve round an imaginary axis.—Oliver Wendell Holmes.

Reflex Paralysis.—Here the leg of one side is trailed to a greater or less extent.

Locomotor Ataxy.—Everyone is familiar with the manner in which the leg is snatched up and brought down with a 'flop' (the 'trampers' of spas); an action much exaggerated when the eyes are closed.

Cerebellar Disease.—Here the gait is that of a drunken person, staggering, unsteady, reeling the 'cerebellar reel.'

Syphilitic Disease.—This produces a crooked spine, and sprawling legs, like a 'daddy-long-legs' walk; quite indescribable, but characteristic enough when Professor W. T. Gairdner imitates it. (The lesion may be in the cord, or cerebral with secondary degeneration, and the result would lay therewith.)

'The Spasmodic Gait or Spastic Walk.'—The combined paresis, stiffness, and tremors of the lower extremity render the gait quite characteristic. The foot seems to cling to the ground, from which it is detached with difficulty, and as it is made to slide forwards, it produces a characteristic scraping noise; while the toes find an obstacle in every elevation of the ground, and the patient readily tumbles and falls.'

In *Hip-joint Disease*, in the early stage the limb is straight, carried forward, or perhaps somewhat abducted; while as the disease advances, the limb becomes adducted, so that the knee is carried against the lower part of the sound thigh.—(Erichsen.)

Of course, as well as these, there are changes wrought by rheumatism; by osseous changes; by gout, corns, a sprain, or a tight shoe, or boot; or, maybe, a cork leg; also alcoholic excess.

Monoplegia.—A cervical lesion may be so localised that a very limited paralysis may follow. As, for instance, one arm may alone be paralysed, or only one side of the face may be affected, or there may be a 'crural monoplegia.' Such monoplegic attacks do not involve sensa-

tion. The muscles of the eye seem specially liable to monoplegia.

Then as well as impaired *mobility* there are abnormal muscular movements to be considered.

Convulsions.—These are commonly seen in the malady called epilepsy. They may be bilateral, or unilateral, or restricted to a group of muscles. The tongue is usually bitten in severe attacks; and the scars on the tongue tell of an old epileptic history. Epilepsy may be unconnected with organic disease, and have no significance beyond unfitting a man for certain occupations, as that of a slater, or sailor, for instance. But it is a common phenomenon of many forms of disease, notably the general paralysis of the insane. The number and severity of the 'fits' are a common test of the progress of the malady, or the success of the treatment. When fits are numerous and recurrent, then the status epilepticus is induced, with marked deterioration of the intellect. Or death from exhaustion may follow an outburst of fits. In the petit mal a twitch of a few muscles, a fixed gaze, or a burst of unmeaning laughter may be all the muscular disturbance set up. Sometimes there is merely a 'monospasm.'

Then there are hysterical convulsions, which may be general and severe.

Tetanus is a most dangerous form of convulsions; and its marked feature is opisthotonos.

Closely allied to this last is hydrophobia.

Convulsions of the limbs, of the lower extremities mainly, may arise from spinal congestion or inflammation, or from sclerosis of the cord. There is a loss of motor power in the last; while 'on lying down, and especially in bed at night or after being fatigued, the legs become subject to clonic or tonic spasms.' In time contraction follows. These irregular muscular movements are readily excited by slight irritation of the skin, especially the soles of the feet.

The convulsions may be 'toxic.'

Spasms.—Spasms differ from convulsions in degree rather than in nature. Spinal convulsions, just spoken of, indeed, are generally termed spasms. Spasms are classed as ‘clonic’ or ‘tonic.’

Tremor is mild clonic spasm ; so are fibrillary contractions. ‘There can be no doubt there are two varieties of tremor, the one persisting during repose, and the other only appearing when the patient makes a voluntary effort ; but whether the former is due to pathological irritation, and the latter is a paralytic phenomenon, is open to question.’

‘General convulsions’ are the opposite, or extreme tremors. Then tonic spasms involve ‘cramp.’

The calf of the leg is the common seat of cramp. This is well seen in labour, when the head of the fœtus is pressing on the sacral plexus inside the pelvis. Some people are liable to cramp when fatigued, or when the stomach is upset ; while cramp is certainly often causally related to gout. A load in the bowels is often found with cramp. Diarrhoea may set up cramp in the abdominal muscles as well as in the muscles of the legs.

Cramps are the contractions of tetanus and catalepsy. Writers’ cramp is an affection of the forearm-muscles of the fingers, set up by long use of the pen. All other movements than wielding a pen can be performed without anything abnormal occurring. A like form of cramp is seen with other habits involving constant use of the fingers, as in violin players.

In athetosis there is a peculiar condition of the fingers and toes, which are in continual movement with some spastic tendency. It may occur with certain diseases of the nervous system, as also with hysteria in women, or be set up by teething in infants.

There is a form of convulsive tremor with hyperæsthesia found in the face, arms, and trunk ; but not in the legs.

Mercurial tremor is arrested by supporting the shaking limb.

Chorea and paralysis agitans both give muscular tremors. In chorea there may be extensive and severe contractions, continuing in sleep; or there may only be localised movements. Chorea gives erratic movements, very irregular in character. While in shaking palsy the movements repeat themselves 'rhythmically and symmetrically on the two sides of the body, presenting nothing of the irregular and rapidly changing character of the true choreic movements.'—Da Costa. Chorea is a disease of the developing nervous system, very commonly linked with a low type of nervous system; while paralysis agitans is a disease of degeneration, usually senile, of the nervous system.

Nystagmus is an affection of the recti muscles of the eye, by which the eyes are kept in incessant movement, often lateral, or at other times rotatory. These movements are aggravated by looking at a distant object, while they are lessened by looking at anything near, or a small object. Nystagmus may be of no significance, or it may indicate disease, especially about the cerebellum and its peduncles.

Spasm of the ciliary muscle may be due to several causes, as strain on the eye; or be reflex, or toxic.

Tic convulsif, or blepharospasm, is a very curious spasm of the muscles around the eye, a sort of exaggerated wink. It may be a mere trick of no significance, and as such seems to have some relations to heredity. In others it may be brought on from conditions affecting the nervous system, or be reflex. This 'histrionic spasm' may last from a few seconds to a few minutes. In blepharospasm the eyelids are closed; in nictitating spasm there is rapid winking; in risus caninus, or sardonic grin, the whole side of the face is generally implicated. The significance of this twitch entirely depends on its causation. If it has always been present, it will probably continue. If it is of recent origin then its cause must be sought for.

Just as neuralgia has its 'tender spots of Valliex' so there are 'pressure points' with spasmodic affections.

Sometimes pressure on one of the spots will arrest the spasmodic action; while in other cases such pressure will excite it.

Midway betwixt modifications of motility and sensation lies the feeling of 'pins and needles,' or of the limb 'being asleep,' experienced from pressure on a nerve-trunk. Temporary pressure on the sciatic nerve will give the feeling of the leg being 'asleep,' while motility is greatly impaired at the same time. It usually passes away in a few seconds. The same impairment of motion with modification of sensation is found in the arm from pressure on the brachial nerve. If the pressure have lasted some hours (as when a drunken person falls asleep with the arm over the back of a chair), the recovery of sensation and motion is more tedious.

Trophic Disturbances.—When pressure or injury to a nerve-trunk has permanently impaired its functional power, then trophic disturbances show themselves, and the skin of the extremity is 'glossy,' and shining, while the pain is 'burning;' or ulceration may follow injury to a nerve-trunk. Weir Mitchell, in his work on 'Injury to Nerves' has done much to point out modifications of nutrition in parts where the nerves have been injured. Indeed, modifications of nutrition carry with them a distinct value at times. Thus 'the nail growth is abolished in recent cerebral palsies, and its renewal may be made an element of prognosis as showing impending recovery. In the diagnosis between functional and organic palsies, the study of the nail-growth comes, as Dr. Mitchell points out, completely into play, and is likely to be of some value.'—Da Costa. When motion is implicated, modification of nutrition comes in in two ways. There is the effect of disease, pure and simple; and there is the effect of injury to the trophic nerve fibrils, held to run along with the efferent motor fibrils, a matter which we can scarcely yet estimate. As seen before, p. 189, modifications of nutrition follow spinal injuries. The nerve-supply of a

part is as essential to perfect nutrition as is the blood supply ; if not, however, to an equal extent.

Disorder of Sensation.—Like the disorders of motility, this may be central, or due to something affecting the nerve-trunk, or be reflex. There are also other matters than mere impairment of sensation. The general sense of touch and the sensation of pain have their own channels, known as the 'tactile' and 'pathic' channels, as, for instance, a patient can tell when he is touched, but cannot distinguish betwixt hot and cold bodies ; or ordinary sensation is unaffected, but the sensitiveness to temperature is exalted. When both forms of cutaneous sensibility are lost the condition is called 'total sensory paralysis ;' if one only, then the term 'partial sensory paralysis' is used, or 'partial tactile paralysis,' as the case may be. Abnormal sensations may accompany the anæsthesia, as 'crawling,' or 'furriness.' Actual pain may be felt in the anæsthetic part.

Anæsthesia.—This may be felt over the area supplied by a nerve-trunk, or even over a part only of such area. In disease of the spinal cord a zone of pain may be felt, 'girdle pains,' or a zone of anæsthesia. Or only one leg may be affected, from a local lesion in the spine. Hemi-anæsthesia is accompanied by the loss of taste and smell, while hearing and vision are but partially affected. Here the lesion is situated on the posterior part of the optic thalamus ; or the affection may be hysterical. Analgesia may follow the same lines ; and so may 'thermo-anæsthesia.' 'Tactile anæsthesia' is usually found in patches on the lower extremities, and in connection with disease of the posterior, or sensory nerve-roots, as in locomotor ataxy. Sensation may also be retarded ; and there are 'persistent after-sensations' at times experienced. Or the power to count successive impressions may be lost.

Anæsthesia may be peripheral, as the result of cold, or due to injury to the nerve-fibrils in the cord. When the latter, there are also modifications of sensations, as the

'lightning pains' of locomotor ataxy, and the impression of walking on a feather-bed, etc. That is, there is a loss of ordinary sensation with certain abnormal sensations. Nor is anæsthesia experienced in the skin only; but also in the mucous membranes, and in the muscles, as 'muscular anæsthesia,' or loss of the sense of weight. It is also experienced in locomotor ataxy. Anæsthesia is common with the insane, especially monomaniacs and general paralytics. Or it may precede a cerebral lesion. Anæsthesia on one side with paralysis on the opposite side is the characteristic of a spinal lesion. Then anæsthesia may be 'reflex,' from disorder of the viscera, or from irritation of a sensitive nerve. Loss of sensation may be preceded by increased sensibility in the nervous centres in organic changes which first increase the functional activity of a sensory area, and then abolish it. A curious loss of sensibility may occur in the face when all, or part of, the fifth nerve is affected. Such trigeminal anæsthesia may be of rheumatic origin—Romberg. According to Vulpian, sensation is rather retarded than lost in sclerosis of the cord. When the vagi are affected the sense of hunger may experience no abatement by taking food.

One great difficulty about disorders of sensation is how to measure the amount of sensibility. In palsies, the facts are fairly palpable; in losses of sensation, there is the patient's interpretation of the sensation, or the loss of it, to be taken into the calculation. Much caution is often requisite in accepting the statements made, and repeated examination, electric and other, may be necessary to verify the statements made as to what is actually experienced.

Something may now be said briefly as to some special modifications of sensation. When a mixed nerve is affected there may be modifications of irritability, of sensation, or of nutrition; and according to these may the seat of the lesion be oftentimes diagnosed. Thus Romberg said of the fifth nerve, when single filaments are alone affected, the lesion is

peripheral; when the face and oral cavity are affected, the disease involves the sensory fibres of the fifth before it divides; when the entire area is affected, the disease is situated in or near the Gasserian ganglion; when also the third or sixth nerves are implicated, and there is atrophy of the optic nerves, the disease is in the base of the brain. By remembering the anatomical relations of a mixed nerve along with the precise disturbance of sensation, the exact seat of the lesion may be determined.

The sense of smell may be diminished by disease in the periphery, in the trunk, or the centres. Anosmia is common with hysteria, general paralysis of the insane, or senile atrophy. It may be the result of a blow or a fever, or it may arise from a catarrhal condition of the Schneiderian membrane from cold. In these last cases anosmia is of less significance than when due to cerebral lesions. False smells and imaginary smells are experienced under certain circumstances, especially with the insane.

The sense of sight is liable to precisely the same disturbance as the sense of smell, and is more commonly affected. So many and numerous are the modifications of sight, that a brief outline is all that may be attempted here. The acuteness of vision may be lessened, or the area limited, or there may be intervals of complete blindness in ovarian troubles, or the sense of perception of colour may be disturbed, or sight may be defective in daylight, or, more commonly, at night (hemeralopia). Without ophthalmoscopic examination it is often impossible to determine whether a lesion as hemiopia be retinal, or be due to intracranial disease; perhaps in the latter the line of demarcation is not so sharply defined. In some cases it is obvious that the eye itself is at fault; while in amaurosis the eye is clear and bright, perhaps sometimes wanting in expression. When only one eye is affected the causal lesion is local probably. Flashes of light in the eye are the result of a blow, or may be linked with megrims, or with

insanity. Abnormally acute sight may be natural, or belong to a pathological condition. The sense of hearing is commonly affected in cerebral congestion, as in the ringing of bells, of cinchonism and delirium, or exaltations of hearing. While in conditions of general debility, the sense of hearing is greatly impaired. The blind usually possess a most acute sense of hearing, probably from training the ear to make up for the eye. Deafness may be due to disease in any part of the ear or the auditory mechanism, and may be partial or complete, as the case may be. The tick of a watch may not be audible when held to the ear, but be distinct when the watch is placed betwixt the teeth; in the last case the lesion is peripheral, and not central. The 'knocking,' or 'whirring,' or 'buzzing' often complained of is usually nothing more than the pulsations of a poorly filled carotid artery upon the petrous portion of the temporal bone; or it may be found with an atheromatous condition of the arterial walls. Sometimes auditory illusions are experienced in complete deafness, from disease of the auditory nerve, just as is the case with disease of the optic nerve. A blind Jewess in the Salpetrière had the most fearful visions, and, on post-mortem, the optic nerves were found to be involved for a considerable length in cancerous disease.

The sense of taste is also liable to disturbance. This varies in significance according to the part affected, the nervous connections of taste being complex. Extremely acute taste, or the loss of it, may depend on passing conditions, as a fever; or may indicate cerebral lesions, or disease in the track of the nerves.

Lesions of the chorda-tympani due to disease of the temporal bone may produce loss of the sense of taste in the anterior portion of the tongue.

It would serve no good end to attempt to lay before the reader any sketch of the relations of modifications of spinal sense or of general sensations. What has been attempted

is some account of the circumstances under which such sensory modifications arise. What the reader must do, and he must do it for himself in each case, is—not to lose his head, and get into a muddle; but to keep the relations of the modifications in his eye, and follow out the anatomy of the affected nerve carefully and with pains. If this be properly done, the seat of the lesion can usually be ‘tracked down,’ to use a hunter’s phrase. In doing this, of course the associations of loss of sensation are valuable: thus disease in the spinal cord will give abnormal sensations referred to the periphery (eccentric projection) as well as loss or diminution of sensation. Osteal and periosteal changes have their relations to nervous disturbances (p. 181). While conditions of the circulation within the encephalon affect the special senses, as flashes of light, and noises in congestive conditions; with loss or diminution of any of the senses with anæmic states, as in the convalescence from a fever. Indeed, the employment of thought is essential to the correct interpretation of the phenomena; and failure or erroneous interpretation is more often due to want of pains, or application, than to the inherent difficulties in the case in many instances. Some time ago, Dr. Ferrier diagnosed a tubercular growth, very localised, in the cortex of the motor area. After death the diagnosis was most minutely confirmed. The locality was determined by his special information as to localisation of function in the brain; but as to the nature of the growth, his accuracy arose from his educated common-sense; the patient had exhibited symptoms of tubercle in the lungs. Between the two a very clever diagnosis was made.

Hyperæsthesia.—A good deal has been said about hyperæsthesia in the preceding section, which could not be avoided, and need not be repeated now. Hyperæsthesia as to locality and temperature may occur with heightened common sensibility as to pain, as in vesicular skin affections. It may be felt over small or large areas, like anæsthesia; and may precede the latter. A girdle sensation as of a cord

being tied round the body 'is a very common accompaniment of all spinal diseases.'

Hyperalgesia is an exquisite sensitiveness, when pain is produced by slight causes, scarcely felt by persons in health. A highly developed nervous system in a woman will give heightened sensitiveness to all sensory organs at certain times and under circumstances, to an extent scarcely credible. A touch will produce pain; while sight and hearing are greatly exalted, and taste and smell are involved.

Abnormal Sensations.—These are common with the insane, and not rare with the sane. Thus pruritus or itching is found with local causes, as scabies; with glycosuria there is pruritus vulvæ in women; ascarides cause rectal itching; while a general itching of the skin is known in cholæmia, uræmia (jaundice and lithiasis), and in diabetes. Formication may be due to irritation at any part of sensory nerve-fibrils. It is felt when the olecranon is hit, or the leg is 'asleep;' and is cerebral at times, or due to some toxic agent. Burning is related to trophic neuroses essentially. Thermo-hyperæsthesia is linked with herpes zoster, and vesicated areas of skin. It is, too, associated with spinal affections, and is at times diagnostically useful in suspected spinal disease, nervous or osseous. Localised sensations of heat and cold are felt, just as there are patches of local anæsthesia or hyperæsthesia ('localised spots of pain') in lithiasis, in hysteria, or in organic disease.

Then there are internal sensations,—as the globus of hysteria; cough, from irritability of the air-passages; anorexia or bulimia, polydipsia, pyrosis, from alterations in the mucous lining of the alimentary canal; while polydipsia may be due to something affecting the nerve-endings which participate in the sensation of thirst. The sensations connected with the reproductive instinct may be exalted by peripheral causes, by centric, or even mental causes, or by irritation in the conducting apparatus. While anæsthesia of the generative organs is not uncommon with

hysterical women. Spinal disease, or injury, may produce either of these results.

A general sense of oppression, or of impairment of power, is found with general exhaustion, or with exhaustion of the posterior lobes. Hysteria will give all and every modification of sensation and abnormal feeling that disease can induce. Indeed, its 'mimetic' power is boundless. The prognosis is widely different, however, in hysteric and organic cases.

In diagnosis, in relation to prognosis, the element of syphilis always improves the prospects from its known amenability to treatment. Of course, too, in this matter the effects of treatment are often of primary value in clearing up the diagnosis.

Indeed, the effects of treatment in many cases are essential to determine the diagnosis, as, for instance, in the impairment of the brain, as the organ of mind; in cerebral exhaustion as distinguished from like impairment in the organic changes commonly spoken of as 'softening,' but probably rather the opposite pathological condition, 'sclerosis.'

CHAPTER XI.

THE PATIENT'S SENSATIONS.

THIS is a decidedly important matter, both for the information it gives, and the opportunity it affords of showing the patient that you know what you are talking about—albeit a subject of which little can be, or is usually, learned in the medical curriculum. When familiar with a disease, it is often possible to realize the patient's sensations, and put the questions seriatim, so as to evidence familiarity in a conspicuous manner. The first matter is shortness of breath, of which something has been said before, at p. 55.

Shortness of Breath.—This has been shown before to be connected with diminution of the lumen of the air-tubes, or infringement upon the thoracic space by air, fluid, or growth. Anything which diminishes the space for residual air in the chest cuts down the capacity for exertion. We all have a great deal of what is called 'spare' lung—that is, an excess beyond what is required when the body is at rest. Without such spare lung, it would be impossible to make an effort. When the lung space is infringed upon, no matter by what, then the margin beyond the indispensable minimum is cut down in strict proportion to the extent of the intruder. Consequently there are times when the character of the respiration, and the effect of effort, will tell you a great deal that you very much like to know. For instance, in chronic bronchitis, in emphysema, in disseminated fibrosis of the lung, the effect of effort in heightening the respirations will

tell how extensive the mischief is, when physical examination may be dumb by comparison. In most cases the physical examination will, of course, tell clearly of the extent of the disease; but there are some cases where it does not, and then 'the physiological factor' is of paramount importance.

But there are some conditions where the physical signs can tell nothing. What are the physical signs of fatty degeneration of the heart? They are *nil*, or nearly so! But the inability to make an effort will often give a most suggestive hint. There may be other suggestive matters, as tendency to swimming in the head, or loss of power, telling that the heart structures are impaired, and cannot keep up the blood-pressure in the arteries of the brain. There may indeed be a number of indications which, taken together, make up a pretty clear case. If there be evidences of senile changes in the individual as well, then little reasonable doubt would remain.

But there is another condition where the heart and diaphragm are both greatly impaired in power, and that is when the assimilation of albuminoids is very defective. These two muscles, in unceasing action, feel the malnutrition more keenly than any other part of the body. This condition has been described by myself as 'heart starvation'—a term giving a vivid conception of the actual condition of affairs. Here, also, the capacity for effort is greatly cut down in proportion to the deficient assimilation. In the one case the muscular fibre is decaying; in the other it is underfed. In each case there is a loss of functional power. So far as function is concerned, then, the two conditions are closely alike. But the one is distinctly 'senile,' while the other is by no means necessarily so. A tottering old man, the subject of extensive senile changes, and a young or middle-aged man brought down by dysentery, may hardly be distinguishable at some distance, or to a casual glance; but when seen closer, the resemblance fades away as the

points of difference become more distinct. So it is with 'fatty degeneration' and its double, 'heart-starvation.'* It is important to make this distinction, which is not always made. It does not redound to the credit of a medical man to diagnose fatty degeneration of the heart, when many years afterwards, with sound tissues, the patient comes to tell the tale as another 'doctor's mistake'!

It is a condition which marks the convalescence from acute fevers, where all the muscles have undergone an acute degeneration (under the high temperature); as such it is often very distinct after relapsing fever. Both this last and 'heart-starvation' present the same features of impaired power in the heart and diaphragm as are characteristic of fatty degeneration; but then that does not justify a diagnosis of the latter, which is essentially a senile change with the worst possible prognosis.

Syncope.—Syncope or 'swooning' may be the result of emotion, and when found with females is usually a mere temporary affair. (Now that it has ceased to be fashionable, 'fainting' is much less common.) A shock may anaesthetise the brain by inhibiting the action of the heart; it may do it so effectually as to produce actual death. Then swooning may occur when the heart's action is inhibited from other causes which throw the inhibitory fibres of the vagus into action, as irritation elsewhere. In a less degree 'feeling faint' is comparatively common, and may arise from some gastric cause acting through the vagus; especially when there is also flatulence or gas in the stomach pressing on the heart through the thin wall of the diaphragm. Romberg relates a case of temporary arrest of the heart's action from a tumour involving the vagus, where 'there was an intermission of five or six beats of the heart. The aspect

* A critic has taken me to task for this expression as 'sensational'; but he suggested no better term. 'The sabre strokes of Saxon speech' are most expressive in their fitness at times. I know no more suitable term.

of the patient showed that at the time something terrible was going on within him; he sat there as if thunderstruck (attonitus), speechless, motionless, his eyes wide open, his consciousness unimpaired.' Here, curiously, there was no loss of consciousness, only loss of all motor power in the attack. Recently a case of inhibited action from some meningeal thickening in the upper portion of the dorsal spinal cord came under my notice. Long periods of unconsciousness occurred in another case, where the heart muscle was largely weakened by typhoid fever. Attacks of unconsciousness lasting some time—long swoons, in fact—have come before me not rarely in connection with aortic stenosis; and when a strongly built person advanced in life complains of the oncome of fainting attacks, it is well to examine for this lesion; if not present, the case will probably turn out to be one of fatty degeneration.

Palpitation.—The sensation of palpitation is one commonly complained of by patients. It may occur with three distinct conditions, and has a significance accordingly. These are (1) muscular failure, (2) lithiasis, and (3) as a neurosis.

1. *Palpitation from muscular failure.* This form of palpitation is distinctly related to effort. When a demand upon the heart is made, it either fails, giving syncope; or it acts tumultuously, or palpitates. When a heart palpitates on effort, its muscular power is impaired. A dilated heart always palpitates on effort, even when the dilatation is blended with hypertrophy; the more the hypertrophy, the greater the power to sustain effort. When a heart, once hypertrophied, begins to undergo structural decay, then palpitation on effort is manifested; and when an elderly person complains of palpitation coming on, such morbid change may be legitimately suspected, whether there be any valvular mischief present or not.

Palpitation on effort may, however, be manifested under a totally different set of circumstances. Some people have

large hearts, just as some people have large noses; others have small hearts, while others have small noses. Latham describes a class of beings with congenitally small hearts, who were unequal to great efforts; while the endurance of the racehorse Eclipse, and of the greyhound Master Magrath, has been attributed to the 'huge blood-pump' found in each. Persons with very large hearts are very 'long-winded,' to use an athlete's phrase—remarkable for their power of holding out. Persons with small hearts are 'short-winded,' and if one of this class is ambitious to be an athlete, his aspirations not uncommonly end in palpitation on effort, until he abandons his elected pursuit. Or even a very good heart may be so disabled by over-effort from distension of the right ventricle, as after violent long runs, and afterwards readily palpitate. This is the condition of 'broken-windedness' in horses which have been over-galoped, and which is recovered from on being turned out to grass. With quiet, the ventricle recovers itself; and the condition is totally different from the gradually increasing 'broken-windedness' of advancing emphysema. Palpitation on effort, then, has several associations, in all of which impairment of the heart's power as a muscle is involved.

The palpitation of approaching dissolution is thus described by Hope: 'It must be recollected that, in every organic disease of the heart, when palpitation becomes extremely violent and prolonged, both the impulse and the sounds may be diminished; in other words, the heart becomes gorged, and incapable of adequately contracting on its contents, sometimes yielding a struggling, convulsive impulse, with little sound and a feeble pulse, and in an ulterior degree, especially during dissolution, scarcely producing either impulse, sound, or pulse. Suffocation, dyspnoea, lividity, and extreme distress are always concomitant symptoms.'

2. *Palpitation in Lithiasis.* When the blood is loaded

with nitrogenised waste, not only is the blood-pressure in the arteries high; but there are also times when this high blood-pressure is further raised by spasm of the arterioles. Such a condition, when very marked, gives angina pectoris, or 'breast pang,' when the heart is acutely distended, and though struggling its hardest, giving little sign thereof; much as in the condition above taken from Hope. When the heart can resist the distension somewhat, it palpitates in its struggle, and 'gouty palpitation' is the result. This gouty palpitation is less serious than angina; in fact, angina is most grave when the heart is too rotten to attempt such a struggle.

This form of palpitation is not linked with effort, but comes on at other times; often the palpitation is distinctly clear of any relation to effort, and then there is comparatively little difficulty in the diagnosis. But as often a mixed condition is found, especially in women. There is a dilated heart in a gouty person, and then there are both 'gouty palpitation' and 'palpitation on effort' found together.

3. *Neurosal Palpitation.* Palpitation as a neurosis may be found along with both of the other forms of palpitation, or be quite independent of either. Thus it may arise from any mental cause of excitement or alarm; or be a part of an extensive neurosis, as in chorea and exophthalmic goitre, in both of which maladies the heart may beat so violently that it seems as if it would burst its prison wall, or shatter off the front of the chest. It is common with ovarian irritability (see p. 155), and the irritation set up in the ovary may terminate in paroxysms of palpitation. Such palpitation may occur in the day, or only occur during sleep, 'the period *par excellence* of reflex excitability.' In the latter case the sufferer is awakened out of sleep by violent palpitation, all the more alarming if at intervals the heart feels as if it would stop. Such is 'reflex' palpitation.

Hope divided the exciting causes of hypertrophy of the

heart into (1) nervous and (2) mechanical. He says: 'The former class comprises all moral affections and all derangements of the nervous functions that excite long-continued palpitation.' When such 'nervous hypertrophy' is encountered, as in certain cases of exophthalmic goitre, for instance, the palpitation is violent, persistent, and intractable.

Sometimes the heart has a very tumultuous action, not amounting to palpitation at all times; but ready to palpitate on slight exciting causes. Such heart is usually found in young women, and may be termed a 'badly behaved heart;' and a very inconvenient possession it is for its owner.

It is almost needless to say that the exciting causes of nervous palpitation will readily affect a heart liable to the first described forms of palpitation.

Palpitation in hysteria is complex in origin. It is a neurosis in itself; and yet it is partly due to arterial spasm, for it is found with a tight artery, and followed by a large flow of limpid urine.

Palpitation may often be a complex affair with several causal relations; but pains will usually unravel the complexity, and separate the different component factors. Commonly its significance is easily read.

Pain.—In many maladies pain, of some form or other, is a prominent complaint; sometimes it is the cardinal matter, as in cancer or neuralgia.

The kinds of pain are so numerous, often so marked, and usually so suggestive, that an attempt will be made here to classify pain in a practical grouping. 'Pain is the protector of the voiceless tissues.' This is a good basis for the superstructure. Say the ankle is sprained; if it were not for the pain produced on motion, the injured part would never secure the rest desirable for repair. Or there is an ulcer in the stomach; here pain secures that comparative rest alone compatible with the healing of the ulcer. Then there is pain which serves no apparent good end, as the pain of

periostitis or of cancer; while at other times, as in pleurisy, the pain compels that quiet which is favourable for the progress of the case. Or in stone in the bladder the pain produced by motion teaches the patient to avoid injury to the bladder from the forcible impact of the stone. Nor is pain always felt in the seat of disease; in hip-joint disease the pain is usually felt in the knee-joint; while the 'shoulder-tip pain' of liver disease is well known. Often the pain is felt in terminal nerve-ending, as in neuralgia.

In inflammation the pain is accompanied by heat, redness, and swelling, the classical association. In neuralgia the pain is 'gusty,' either when only felt at times, or when, in severe cases, there is always more or less pain. Herpes zoster is a neurosal skin affection following the track of a nerve. The pain is burning and stinging. Sometimes the eruption does not accompany the pain; but the pain of *herpes sine eruptione* is distinctly stinging, and comes on in gusts. In locomotor ataxy the pains are sudden and severe, and have been called 'lightning' pains. While the pain of rheumatism is dull and aching. In gout the pain is sharp, sometimes excruciating; as was the pain of stretching ligaments under the torture of the rack.* Then the pain of cancer is stabbing or lancinating. The pain of inflamed serous membranes rubbing on each other is acute, and aggravated by movement. Then 'the same abnormal action does not always create the same kind of pain. Inflammation, for instance, causes different pain as it involves different structures; the pain from an inflamed pleura is not the same as that from an inflamed muscle. Speaking

* Perhaps it is a little out of place here, and yet not altogether, to think of the pain of the rack. Some bore the first racking with unflinching courage, but broke down on the second or third trial. When we think of forcible extension of joints inflamed by the first stretching, we can conceive the agonising torture inflicted by subsequent applications of the rack; it would be more than human nature could bear, however determined.

generally, the tissues themselves seem to determine the form of pain more certainly than does the precise character of the morbid process. Thus, pain in diseases of the periosteum and bones, no matter what may be the exact nature of the malady, is mostly burning and constant; in the serous membrane sharp; in the mucous membrane dull; and in the skin burning or itching.—Da Costa. The pain of an injured or inflamed muscle is dull and aching, and aggravated by movement, *i.e.*, the contraction of the fibrillæ. The pain of a sprained joint is severe and sickening at times. In *ostitis* the pain is deep-seated, and the part is very tender, while it is aggravated at night; 'and when the disease is chronic is much influenced by the weather.' Pain in nerves is often tingling, and if produced by a blow, is felt at the terminal or peripheral endings, as, for instance, a blow on the olecranon is felt as tingling in the little finger-end. When a nerve is nipped, as by a cancerous growth, or by pressure, as in periosteal thickening diminishing a foramen through which a sensory nerve pierces the spinal column, it has a lancinating or stabbing character. The pain of an abscess forming is 'throbbing,' while that of cancer is characteristically 'lancinating.*' It is also well to reflect on some relations of pain: it is aggravated by movement in joint or muscle; when osteal it is 'nocturnal,' when connected with a nerve it follows the nerve trunk.

Some time ago a gentleman consulted me about a persistent pain, at some times worse than at others, at the outer edge of the left scapula, about the middle. The first thing to note about it was that it was evidently connected with one intercostal nerve; next, that it was aggravated, or relieved by certain movements; then it was worse at bedtime, while it was relieved by a warm bath. (When the vessels dilate on the oncome of sleep any further

* Cancer produces no pain in itself: it is when a nerve-fibre is caught in its terrible grip that the pain is set up.

tenseness of a part thereby increases the pressure, and with it the pain; consequently osteal and periosteal affections are worse when the relaxation of the vessels leading to sleep is set up. The relaxation of the cutaneous vessels by a warm bath relieved the vascularity of other parts, and with it the pain of tension.) The diagnosis was unavoidable that the cause of the pain was pressure on the sensory root at the foramen where it emerged from the spinal canal. The case was 'rheumatic,' in the sense that the gentleman was liable to rheumatic pains; but on inquiry there turned out to be a possible syphilitic taint dating far back. I thought it well to take the opinion of Mr. Jonathan Hutchinson, who agreed with the view that the pain was due to the pressure of the thickened periosteum; and that the periosteal mischief was probably specific. (Relief was gained by iodide of potassium, while all other treatment previously advised was futile.)

The relations of any pain are worth investigation. Take lumbago, for instance. It may be gouty or rheumatic, and muscular when motion increases it. If there be periosteal complications, the spinous processes of the vertebræ will be tender on pressure. A load in the bowels would lack these features. A renal calculus would give unilateral pain, with reflex vomiting. Lumbar abscess also gives unilateral pain, and has its own features. Myalgia, or 'backache,' is found with debility, and is much more intense on movement, and relieved by lying down; while lumbar neuralgia bears a relation to a nerve trunk, and has its 'spots of pain.'

Neuralgia is accompanied by these 'spots of pain,' otherwise termed 'the tender spots of Valleix.' The 'pain under the heart,' so common with women, is intercostal neuralgia, with the main tender spot near the left apex of the heart, the one usually complained of; a second, at the outer edge of the scapula, about its middle; and a third, where the nerve pierces the spine. The pressure of the finger-tip on

these 'tender spots' will usually be sufficient to cause sharp pain. Movement does not affect this pain; while in intercostal rheumatism the reverse is the case, and the tender spots are wanting.

Having grasped the subject of the varieties of pain according (1) to the tissue affected, and (2) the nature of the affection, the reader will follow with more interest the description of some of the leading pains complained of. It may be well to start from the crown downwards.

Headaches are of various kinds. There is the 'sick-headache,' frontal and depressing. There is the 'occipital' headache of venous fulness about the *Torcula Hierophili*; sometimes it is really neuralgia of the occipital nerve. Then there is the side-headache, due to the eyes not being absolutely a pair. Also the face-ache, often involving the eye, of a carious tooth. There is the nervous, or neuralgic headache of women, sharp and short; and the true facial neuralgia, with tenderness of the supraorbital, sometimes the infra-orbital nerve-ending. There is 'hemicrania': may be periosteal with a syphilitic node at times; or it may be migraine with optical disturbance and gastric symptoms. There is the pain of ear-disease. The dull vertical pain, with sense of weight and depression, of cerebral anæmia is very common with women; and in practice, acquaintance with 'vertical' headache is very useful. Then there is the 'congestive' headache, as if a bolt were driven into the head, of vascular fulness. And the 'toxic' headache, best known after alcoholic excess. When the cerebro-spinal meninges are involved, then pain is maddening. The brain does not feel 'pain,' that is, physical pain, when affected until the meninges are reached, and implicated, and then pain is felt; awful and excruciating often. It has been said (*Hughlings Jackson*) that frontal headaches are linked with abdominal disturbances; vertical headaches with cerebral affections; and occipital headaches with disturbance in the circulation.

The essentially facial pains are 'brow ague,' and facial neuralgia. The last is usually, or rather commonly, on the right side; while intercostal neuralgia is almost always on the left side. As to the particular nerve-twig affected, it must be sought in each case.

The pains felt in the neck are neuralgic, or from enlarged glands, or laryngeal affections mainly.

Thoracic pains are commonly a spot of pain in the pectoral muscle, or over it, sometimes near the nipple, sometimes near the sternal attachment, corresponding in significance to the spots of pain at the back. Then there is intercostal pain, spoken of before (p. 212). Sternal pain may be osteal; or it may be the pain of angina pectoris, which may be a neuralgia, as in anæmic women, or truly cardiac in oldish men. Pains about the heart bear no relation to the heart, except angina. Disease of the heart gives no pain, except pericarditis. The 'pain of Piorry' at each contraction of the heart in myocarditis is mythical. Organic chronic disease of the heart does not include pain among its symptoms. Then there is a sternal pain often complained of in dyspepsia. Pain, with weight and oppression, is often complained of in thoracic maladies down to a sharp cold.

Thoracic pain at the back is often dyspeptic; this 'gives pain betwixt the shoulders.' Then there are 'spots of pain,' chiefly at the lower edge of the scapula, towards the spine, which can be 'covered with the thumb-end,' which are commonly pronounced 'liver' or 'kidney,' and which are certainly related to conditions where the blood is laden with nitrogenized waste. Then there is the boring, burning pain in the spine of an aneurysm eroding the spinal column, worst at night; and the lancinating pain of cancer in the intervertebral cartilages.

Abdominal pains are numerous.

Pain in the stomach is felt after food immediately, and violently in gastric ulcer, relieved at once by vomiting.

Then there is the pain of indigestion, with or without flatulence, which, however, may be linked with carcinoma. When felt soon after a meal, the body of the viscus is probably affected; if not till an hour or more after a meal, it points to the pylorus, or the duodenum. Then there is pain in the gall-bladder, 'biliary colic.' At times a knuckle of the great intestine contains some flatus, and here pain is felt when the vermicular action passes over this knuckle; no matter on which side. Intestinal pain is referred to the navel. Whenever 'navel pain' is complained of, it is well to examine the bowel carefully, even for an obturator hernia. 'Girdle pains' round the abdomen tell of the spinal meninges being implicated. 'Colic' is spasmodic pain, due to contraction of the circular fibre of the bowel. It may be very severe. Abdominal neuralgia is a true neuralgia (see p. 116). Bowel pain may be felt locally from local causes.

Abdominal pain at the back may be lumbago (p. 212), or be ovarian, or uterine in origin. Backache may be one of the early indications of a specific fever, especially small-pox.

Pelvic pain in man is usually vesical. When due to a stone in the bladder, movement aggravates it. When a boy is suspected to have a stone in his bladder, get him to jump down from a chair; and then try to get him to do it again! His compliance with the request will usually settle the diagnosis in the negative. In stone in the bladder, and in retention from stricture, the pain is usually felt in the glans penis.

In ureteral colic the pain is felt in the testes and down the thigh; indeed, at the terminal endings of the genito-crural nerve.

Pelvic pains in women are often suggestive. There is the expulsive 'bearing-down pain' of constrictive dysmenorrhœa, or of an enlarged, heavy womb. There is pain connected with the ovary. If lying high over the colon,

pain is produced by the act of defæcation; if the ovary be in front, the pain is rather associated with the act of urination. Sometimes the tender ovary is pained in coitus; while coitus is intensely painful, or altogether unbearable in vaginismus, or caruncle of the meatus of the urethra. Pains are felt in the sacrum, and the coccyx, in various uterine and ovarian conditions, or over the crest of the ilium or down the crural nerve.

Disease in the hip gives local pain, aggravated by throwing weight on the limb; or in morbus coxarius may be in the knee; or there may be sciatica. The latter has its tender spots when neuralgic; one at the lower end of the sacrum, one on the side of the trochanter, a third at the head of the fibula, and a fourth behind the outer ankle.

Pain is felt in the limbs; and by attention to the character of the pain, its relation to motion, or to the act of sleeping, as well as its anatomical relations, it can usually be made out clearly as regards its causation. Gouty pain in the great toe may be mistaken for a sprain; but it soon discloses its real nature.

In ulceration of the articular cartilages, the pain is always relieved by separating the affected surfaces, and increased by pressing them together. In hip disease it is not easy to get the patient to stamp vigorously a second time with the affected limb.

The correct interpretation of pain usually involves thought—sometimes much thought. Beyond its anatomical or histological recognition, there are its general relations; and the following piece of graphic writing by the late Dr. Fuller has always impressed me; and in the hope it will act in a similar manner on my readers, it shall be given *verbatim*. The subject spoken of is sciatica:—‘If the patient is thin, pale, sallow, and extremely sensitive to atmospheric vicissitudes; if he has experienced pain, or threatenings of pain, in other parts of the body; if at some former period he has suffered from rheumatism affecting the joints; and above

all if his present attack is the result of exposure to cold and damp, the disease under which he is labouring is rheumatic, and is to be relieved by vapour-baths, guaiacum, alkalies, and similar remedies. On the other hand, is he stout, florid, and a free liver, taking little exercise, sleeping much; is he plagued with heartburn, acid eructations, and occasional lowness of spirits, or has he previously suffered from gout, his malady is of gouty origin; and is to be cured by colchicum, alkalies, and alteratives. Again, is he cachectic, and out of health; has his throat been ulcerated, or his skin disfigured by blotches or eruptions; has he taken mercury or experienced pains in his bones, the mischief is probably due to syphilitic taint, and is to be cured by sarsaparilla with iodide of potassium. Or again, is he robust, and usually in the enjoyment of excellent health; has his present attack been preceded by constipation or irregularity of the bowels, by flatulence, distension, and crampy pains in the abdomen; and above all, is it accompanied by coating of the tongue and foetor of the breath; then, if the disease does not acknowledge either of the origins before alluded to, it is probably due to irritation of the sacral plexus of nerves consequent on an unhealthy loading of the intestines. This opinion will be confirmed if the pain be confined to the right leg, for the disease not unfrequently arises from unhealthy accumulations of fæcal matter in the caput coli. Such a case as this is to be cured by the administration of active purgatives, both in the form of enemata, and by the mouth, together with such other medicines as are calculated to carry off the irritating matter, and to produce a more healthy secretion from the bowels. . . . Again, if the patient has never experienced an attack of gout or rheumatism, and has not suffered from wandering pains in the limb; if he is free from venereal taint, and has not been subjected to a course of mercury; if his bowels have been acting regularly, and the dejections are of a healthy character; if his skin is healthy, his tongue clean, his urine clear,

his pulse normal, and the appetite and digestion good ; if, in short, there is an absence of the symptoms which indicate either of the forms of derangement hitherto alluded to, his malady is probably of neuralgic origin, and is to be relieved by tonics, sedatives, and other remedies directed against that variety of derangement.' It is, then, of moment to regard pain in connection with general conditions, as well as its tissue and anatomical (regional) relations.

One thing, too, must be grasped about pain. Any irritation of a nerve-fibril on its route from the periphery to the centre is referred, as a sensation, to its terminal ending. A postman in the North, who had lost an arm above the elbow, often complained of his little finger aching with cold on cold mornings. The cold really affected the nerve ending in the stump, and was felt—especially in the fibrils which ran to the little finger—long after the member itself had gone. The term 'phantom limbs' is given to these sensations. 'Flashes of pain' over certain cutaneous areas not distinctly related to the distribution of any particular nerve-twig—at least, so far as has been observed—are found with gout. Sometimes passing sensations of heat or cold are experienced locally, as after a blow on the sacrum, when one or other buttock will be liable to be so affected at intervals, and for a brief period only, for some time afterwards.

Pain has relations yet but imperfectly understood, as 'the shoulder-tip pain' of liver trouble. In one case known to me, if the umbilical boss be lightly scratched by a finger-nail, a sharp sting of pain is instantly felt at the centre of the upper surface of the glenoid cavity on the left side (the shoulder-tip). It is no imaginary association, being experienced when all thought of it has been dormant for months.

Tenderness.—This may exist with or without actual pain. In inflammation, 'modification of the sensibility of the part, owing partly to increased sensibility of the nerves, but chiefly to the pressure exercised on their terminal branches by the dilated blood-vessels, manifests itself by the occur-

rence of pain, or by some special nervous sensibility of the organ; thus, in the eye, by the patient perceiving flashes of light, and in the ear by noises of various kinds; in the bladder by a constant desire to expel the urine; and in the kidney by a desire to urinate.'—Erichsen. There is, in short, an exalted sensibility—a hyperæsthetic state, probably due to the increased vascularity—which gives pain on slight excitation. The part, usually inflamed, is exquisitely sensitive, and a slight touch or movement will give actual pain, often severe.

There are other general conditions of much moment which may next be considered, of which the two most important are sleep and the appetite.

Sleep.—The amount of sleep natural to different persons varies. Broad stout persons usually require, or at least seem to require, long hours of sleep. Persons of thin flank with comparatively large heads, seem to require only short hours of rest. Some women of this type seem almost never to sleep when there is anything to be done requiring wakefulness. Consequently, in estimating the importance, or extent of sleeplessness with any patient, the mere hours of sleep must not alone be taken, without further consideration. Then there is a consensus of opinion, both with medical men and nurses, that patients do actually sleep more than they themselves think, or will admit. Though, perhaps, on the whole, very sleepless, they drop off at times and get a brief nap, of which they do not seem to be conscious; and which, consequently, they will not admit.

Speaking broadly, with the exception of coma and drowsiness (due to the typhoid state, to carbonic acid poisoning, to uræmia, and conditions of cerebral disease, or pressure on the hemispheres), the more a patient sleeps the better: the less the worse. Certainly such is the case in acute disease interfering with sleep. Consequently the question of inducing sleep artificially requires consideration, and the adaptation of the means to the end in all cases.

Sleep requires the condition of cerebral anæmia as a necessary indispensable factor. Consequently a common cause of sleeplessness, especially with women, is 'cold feet.' The feet, and much of the legs, are chilly, deathly cold. Here the smaller arteries and the arterioles are contracted, and do not relax. Now, when sleep comes on the vessels of the rest of the body relax (as was seen in discussing nocturnal pain, p. 211), and so the brain can become exsanguine. But with 'cold feet' a large area does not relax; and the brain, still full of blood, cannot go to sleep. When the vessels of the lower limbs are relaxed, then sleep readily follows.

Then there is another matter: the patient is drowsy, sometimes painfully so, when up; yet when the head is laid upon the pillow sleep declines to be wooed. Here there is cerebral anæmia. When upright the blood falls away from the head, the apex of the organism, and the bloodless brain is drowsy. When the head is laid upon the pillow the blood flows into it freely, and wakefulness is the result. The sleeplessness of cerebral anæmia is not at all uncommon.

Then pain prevents sleep. Pain not only excites the brain by the sensations conveyed to it by the sentient nerves; but it affects the circulation, keeping up the blood pressure. (All hypnotics lower the blood pressure by relaxing the blood vessels, and so lower the action of the heart, as well as acting upon the cells of the cortex, palsyng their energy; and by this double effect produce sleep.) Consequently when the patient has been able to sleep that fact is of moment, telling that the local cause of sleeplessness has been less than before. A bad night usually tells of a rising inflammation, a growing abscess, etc.

Then high temperature is a cause of sleeplessness. When blood abnormally warm is coursing through the brain, it excites the brain-cells into restless activity (the delirium

of acute pyrexia); and when the temperature of the blood falls the patient drops asleep.

These relations of insomnia to pain and to a high temperature are of service in estimating the condition of the patient from day to day when actually ill. (All hypnotics lower the temperature by their effect upon the circulation.) In fevers the restless night, or the delirious unrefreshing sleep of a rising pyrexia, contrast with the calm invigorating sleep of a falling temperature, especially with a moist skin. Then at other times insomnia is related to mental conditions. It may be from mental worry, anxiety, or 'carking care.' Such condition is well seen in females who are worn out with nursing some one, say a husband, whose death has been the end. Here they can do nothing but support the negative; they can only negatively oppose. Obstinacy is the leading mental feature; sleeplessness their bodily manifestation of their condition. The brain nearly worn out is irritable, unreasoning, wilful, obstinate, and unmanageable. Sometimes actual insanity is reached. Here sleeplessness is the measure of the tax upon the brain. At other times the waking thoughts refuse to be put aside, and crowd upon the consciousness, each struggling to the foreground. Here there is one of the most significant indications of continued, often long-continued, overwork.

In other cases again the sleeplessness is due to the necessity for voluntary effort to maintain the respiration, as seen in acute disease of the respiratory organs; or in the dyspnoea of a failing circulation, as at the end of a mitral case, for instance. Here the patient could sleep, and sleep soundly without any soporific agent, if only the necessity for breathing, the accumulation of carbonic acid in the blood stimulating the respiratory centre, was done away with. The patient begs for sleep, and if the request leads to a narcotic being given (on the impression that it is indicated), the voluntary efforts are arrested and the patient sleeps—to wake no more. There are few more painful experiences

among the many furnished by a medical career, than the sight of a patient worn out for want of sleep piteously begging for a sleeping draught, whose request must be sternly refused; or the victim of carbonic acid poisoning, waking up in alarm from a hideous dream, sleepy beyond measure, yet fearing to give way to sleep—for that hideous incubus is sure to come again!

Under all the circumstances given here, to find the sleep, as differentiated from a comatose condition, increasing is a good sign, and matter for congratulation. Some persons object to sleep artificially procured, as less refreshing than natural sleep. Quite so; but better that than none.

A minor condition of sleeplessness is often due to an empty stomach. Some food late on, with that demand for blood in the abdomen which food in the stomach brings, will usually win the capricious goddess Sleep. In many cases of invalids and persons not strong, sleeplessness means no more than this. At other times, sleeplessness is due to a cold bed preventing that relaxation of the arterioles which is requisite to sleep.

Then there is the opposite condition, of drowsiness. Here quite commonly the complaint is, 'I sleep ever so much; yet the more I sleep the more I want to sleep.' Here there is rarely more than a need for sleep; and if the craving be complied with, the condition is sooner or later relieved. There is a popular impression that it is physically injurious, and morally blameworthy, to sleep during the day. Certainly laziness need not be encouraged; but in the present day, too little, rather than too much sleep is the mistake committed. Drowsiness is a symptom of cerebral anæmia then.

But at times it is significant of deficiency of arterial blood with excess of venous blood; the drowsiness of carbonic acid poisoning, as in heart failure; or it may be coma coming on from uræmia, or from an enlarging clot, or sunstroke. 'Dead-drunk' is not the sole cause of drowsi-

ness deepening into coma. At other times it is seen as a form of apoplexy, or acute cerebral anæmia, coming on quite suddenly. Here we can scarcely call the state sleep; and yet it is 'sleep,' an unconscious condition of the brain. A similar condition of acute cerebral anæmia is that of syncope from arrest of the action of the heart. 'Coma vigil,' or waking coma, is often seen with children, and is ever of evil omen.

Bearing all this in mind, it is well on entering a sick-room to inquire what kind of a night the patient has passed. The answer given will often supply a direction for other inquiries and observations. In all ordinary illnesses a good night is cause of satisfaction; and returning sleep tells of returning health and strength.

Having inquired about the sleep, the next everyday matter is to ask after the appetite.

The Appetite.—This, too, varies greatly with different persons. Females as a rule eat less than men; certainly less at once, and therefore at shorter intervals. This is a matter not to be forgotten. Remember what was said about the large and small tender (p. 106). Growing children usually have a good appetite. In the onset of acute maladies the appetite disappears to return again, often vigorously, on convalescence. After acute fever, the appetite is often simply voracious. This is normal 'bulimia.' Then there is the bulimia of muco-enteritis, and of some cases of phthisis (p. 110), which is morbid; and here the craving is not of good omen. An unusual appetite may be the precursor of an attack of gout, or even a fit of epilepsy. A form of bulimia as persistent hunger, was called of old 'the wolf at the stomach;' which probably depends upon some disordered state of the upper portion of the alimentary canal. As thirst is felt in the fauces, hunger is felt in the epigastrium.

Anorexia, or loss of appetite, marks all febrile conditions. Then it is lost in maladies preying on the mind. A loath-

ing of food is experienced as an indication of some neurosal disturbance in women of the nervous temperament; while entire abstinence from food is practised, or rather, affected to be practised, by impostors, usually young females, as seen in the Welsh fasting-girl's case: when warm in bed so as to need little fuel to maintain the body temperature, it is astonishing what small quantities of food will sustain life. (The same is seen in shipwrecked mariners in the tropics; while in cold regions the body-temperature would soon fall below the point compatible with life.) In wasting illnesses the appetite will often fail some time before death. First, solid food is refused, then fluids are declined; and soon after the patient dies exhausted. About ten days is the store of food the organism carries within it; and this is about the time patients, slowly sinking, will survive after all food is refused, and only a little wine or brandy-and-water accepted; much depending on the body-temperature and the surrounding temperature, and not a little on the family peculiarities; some finding it much harder to die than others. This last was marked in a family where I attended the mother, over ninety; she simply 'failed,' and took her bed, and slowly died. The day before her death she made her servant search the pillow for 'pigeon's feathers:' there being a superstition that 'the parting' cannot be accomplished if there are pigeon's feathers mixed with the ordinary feathers of bed-furniture. Years afterwards, her son, long an invalid, caught bronchitis in a London fog, and resigned himself to die. But he did not find this so easy; and some days after his ordinary medical attendant had looked for dissolution, he made an effort to struggle again, and tried to take some food; but in vain. Altogether, he lived ten days after his medical man, who had known him intimately for many years, expected his death hourly. From my experience of his mother, my view was more correct as to how long he would hold out. When a patient is ill, the sleep, the appetite too, and to a

less extent the tone of voice and the grip of the hand, are matters to be carefully noted; and, if so noted, will give valuable information.

[The youthful reader will excuse my here drawing his attention to the mental attitude of the patient, and the patient's friends. From their experience they have formed their opinion of what is to be expected from a medical man. They have seen old practitioners go carefully over such matters as the kind of night passed; the appetite, the bowels; the urine, inspecting the dejecta and the urine at times: and the friends expect all this, and not unreasonably, from younger practitioners. The omission of attention to these details will not only deprive the medical man of much useful information, but it may further deprive him of the confidence of those connected with the patient; and though that is merely a source of annoyance—perhaps not always that in hospital practice—it becomes a very different matter with private patients. And when the patient can take a little food, a brief but judicious allusion to the food to be taken, its character and amount, is not time thrown away. The successful man is the man who knows human nature as well as his profession—who can estimate what is going on in the minds of others, as well as be conscious of the workings of his own mind.]

There are two matters psychical which the experienced practitioner learns to value, and which may now be mentioned as affecting the diagnosis—that is, the diagnosis not of the malady so much as the estimate of the prospects of the individual; an essential part of the diagnosis.

Temperament.—This is often a factor in a case too little calculated. There is the sanguine, elastic temperament which rebounds after the depression of illness with much energy, giving a rapid and satisfactory convalescence. While on the other hand there is a languid, lethargic temperament, where the patient readily goes down under the blow of disease, but is very, very slow indeed in getting up again. This

last class 'make no fight' under serious disease, and sink under a malady the first class would probably throw off successfully. The same amount of disease will be fatal in the one case, but be recovered from, in all probability, in the other. Experience teaches the painstaking observer to discriminate these two classes, and to be guided thereby in prognosis both as to the probability of recovery in the first place, and the length of time requisite for recovery in the second place. In making the estimate of the psychical factor, the life history of the individual must be taken into the calculation. For instance, some months ago I was called into consultation on the case of a suburban butcher's wife. She had some consolidation at the right base of no great extent, yet her ordinary medical attendant was very anxious about her—an anxiety quite shared in by myself on seeing her. She was a woman of no nervous energy, and she had no mental resources; her life had been spent in chatting to the customers and keeping the accounts in the shop. Taken away from this environment, life had no interest for her. She lacked, too, the mental stimulus of motive, often a large factor in illness. She was passive—nay, impassive; and it was only too clear she would go down under the disease without a struggle (which she did).

Lack of nerve-power—especially when combined with lack of mental resources—is ever of bad omen; and to be allowed for in the estimate of the amount of danger to life involved in any case. There is the mental constitution as well as the bodily constitution to be estimated in the calculation of the patient's prospects. Closely allied to this is the amount of courage possessed by the patient. Where the fear of death is great, the danger is increased by the patient's anxiety; while a calm, unemotional attitude is favourable to recovery. Still more propitious is the attitude of a strong motive to live. Under this last, persons will rally and recover from the gravest conditions (compatible with recovery) in a manner truly wonderful at times. Some

people, in plain English, worry themselves to death; while others seem to put death behind them by an effort of will. The elastic temperament carries with it a widely different prognostic association than that which attaches to a languid, listless, hopeless temperament.

Then there is also the question of temperament as regards the obeying of instructions. In many cases the prospect is profoundly influenced by the attention paid to the instructions given; provided those instructions themselves are wise. Take a case of recent dilatation of the heart, for instance; the medicinal treatment will produce a good result, quickly or tardily, according as the patient keeps quiet and gives the enfeebled heart rest, so that it may recover itself. In a hospital, where the patient can be made to stay in bed, the case probably makes a brilliant recovery. In private, if the patient be careless, or headstrong, or imprudent, the recovery will be much slower. Temperament, as concerned with obedience to orders, is a very considerable factor in diagnosis as involving prognosis. In my own note-book, the prognosis given is often this: 'Favourable, if the patient does as bid.' And obedient patients usually obtain their reward!

Some little time ago, a patient presented herself with slight threatenings of phthisis. The disease in itself was nothing; yet the prospect of the case was clearly very gloomy, for there was a terribly low nervous system—the patient was merely an animal. She was advised to keep very quiet, and go to a retired place by the seaside. Within a week she went to a ball, danced over twenty dances, and was preparing to get married. It was not difficult to see what the end of this case would be before long.

Something too depends upon the temperament of the medical man. One man whispers hope, while another brings despair to his patients. Few successful practitioners belong to the latter class. A weak man hesitates in emergencies; a thoughtless man acts precipitately; the result is

disaster in either case. A resolute medical man usually communicates something of his own mental attitude to his patient. A calm unemotional man will often 'pull the patient through' by dint of his own character. It is bad enough for a patient to feel that he, or often she, is going to die, without the doctor's face indicating the same opinion in him. There are persons who should never be allowed to enter a sick room; their presence is murderous. Others again, cheerful and bright, breathe life into sick persons. The temperament of the nurse or attendants is far from unimportant in many cases. All these apparently little matters the prudent medical man will take into calculation when appraising the prospects of a patient.

Linked with the matter of temperament comes that of the patient feeling ill or well: better or worse. The posterior lobes of the cerebral hemispheres are linked with, or related to, the systemic condition. When all is well the subjective sensation is that of 'feeling well;' when 'out of sorts,' or 'feeling poorly,' there is something wrong, somewhere. Next to the questions as to the sleep and the appetite comes that of 'How do you feel to-day?' The answer tells much, often very much in acute disease. In chronic affections the condition varies; one day the patient feels very well, another day not so well. The feelings are of importance when deciding upon what to do; as, for instance, whether the patient should sit up a while, or go out for a drive, or walk. These matters may seem unimportant to the man fresh from the hospital, where experienced persons decide such-like matters, without saying much about them; but they are far from unimportant in private practice. Indeed, quick apprehension, or judicious conduct gained by experience, will often keep a case doing well, which otherwise might end in disaster. It is of little use for a ship to survive the storm to be wrecked at the mouth of the harbour by injudicious steering.

In that department of diagnosis which deals with the

amount of danger to life involved in any case, either acute or chronic, much depends on 'the personal equation' of the medical man. One is hopeful and sanguine, another inclined to take a gloomy view of every case: so will be their prognosis. A very eminent and excellent physician, who was himself the subject of grave valvular disease of the heart, came to take the worst possible view of many cases; he seemed indeed to transfer the gloomy prospect of his own case to the opinion he formed of the cases of his patients. Here the intellect was warped by disease. It is human to err; and err we must in our opinions as medical men at times. Of the two directions it is probably better for all if the medical man err a little on the sanguine side. Remember, too, the prognosis may influence the result. If all breathes hope, the patient will have a far better prospect than where a serious gloom, the shadow thrown forward of funereal solemnity, pervades the mental atmosphere. Very often the doctor's voice and countenance give the key-note to all. Cheeriness is an excellent quality for a medical man; nor is it either necessary or desirable to lay it aside and put on an air of deep gravity when entering the bedroom in a hopeless case very often. The air of an undertaker is not that required by a medical man; by sensible persons, at least.

CHAPTER XII.

THE PATIENT IN HIS BEDROOM.

SOME years ago, in a conversation with a medical brother of some experience, the subject cropped up of the behaviour of the medical practitioner in the sick-room, when he said :

‘Yes, what a pity it is that the demeanour in the sick-room is not more studied by young practitioners ! I remember well when a distinguished graduate of the London University settled among us, a number of us were delighted to have a neighbour to call in who could help us in some matters, not taught in our college days, in certain difficult cases. He had the knowledge too, but the scheme was a failure. He was not familiar with the sick-room, and the friends of the different patients at once noted this ; they could judge of that, and measured him accordingly. Of course, they could not estimate his knowledge.’ The conversation sank down into my mind, feeling how true this was, that the friends could only estimate the man by some test known to them ; and how unfortunate it was that the man’s real worth was so unhappily handicapped. Since then my advice to young men on entering practice has still more decisively taken the direction—‘Spend a couple of years as assistant with a man in good practice, and learn to be familiar with private patients. Do not make your inevitable mistakes where you mean to settle ultimately !’

Some have taken the advice ; others have not been able to realize how they could possibly require any such train-

ing; making a mistake with them seemed quite out of the question. Yet it is to be feared they have not been exempt from the common lot of frail humanity. In the belief that this aspect of entering practice is one not sufficiently studied, and that many a promising man wrongs himself by the neglect thereof, the subject will be carried a little farther; as it has clearly to do with his usefulness.

Some time ago I asked two young medicos, each having been a resident house-surgeon, the following question: 'Suppose you were visiting an old gentleman of about sixty years of age, who is recovering from a sharp attack of bronchitis, and can sit up about three hours a day; you find him wrapped in blankets in his arm-chair, and a sharp-looking old lady reading the newspaper to him. What will you ask?' Each got so far as to ask, 'How are you to-day?' One got a step further: 'How is your cough?' Then the interrogation ceased—the well of inspiration dried up! Yet neither were fools; they were, in my opinion, fair average specimens of the young hospital medico contemplating private practice. When asked what they would do, with the greatest alacrity they declared they 'would have up his shirt, and examine the backs of both bases' (lung). Now this of course would be hospital practice; to neglect to do so would be to run the risk of a 'wiggling' from the visiting physician. 'What!' I asked, 'with the old lady sitting there?' Neither seemed to take the old lady into account at all; that part of my question was quite superfluous, apparently. Both looked a little taken aback at their want of gallantry in overlooking the old lady. In actual practice that old lady could not be safely ignored. She had seen lots of doctors before; was there to form her opinion about the new doctor, as one factor in her presence there, in all probability. They are both in good practice now, and quite recognise two things: (1) that old ladies are not to be ignored; and (2) that an old gentleman who is scant of breath does not want to be disturbed out of his

chair and his blankets, and have his back chilled, without a very good reason for it! If there be some strong reason to suspect mischief, as a rise in the respirations, then something will probably be found to justify the examination. But if nothing be found, the old gentleman and the lady would probably criticise the doctor in no very friendly spirit. The young practitioner may depend upon it, it is a good maxim in practice about giving a patient some discomfort, 'Don't look for something unless you are pretty sure you will find it!' If there is nothing to be found, then you look, in the eyes of others, as if you did not know your business; unless you have previously said you did not expect to find anything—and in that case, why disturb the patient's comfort? If you have a fidgety patient, particularly a doctor himself, it might be necessary to examine the back to assure him there is nothing going on there.

With these preliminary remarks, the subject matter proper of this chapter may be discussed.

First note whether the patient is in bed, or up. If the latter, if he is in his chair, and how he looks—whether at ease, or not. Then listen to his voice, and take in its timbre. Shake hands with him, and take a note of the grip. Not only should this be done on being first introduced to the patient; but it is well to note all on each subsequent visit. If the voice be fairly strong and steady, and the grip be firm, so as to be distinctly felt, the patient is clearly not sinking; however alarmed about him his friends may be. If, on the other hand, the patient be listless, speaks with difficulty, and the hand is languid and limp, the condition is grave; no matter what the malady. Should the patient be lying on his back in the middle of the bed, with a vacant countenance and sordes on his lips, taking no notice of your entry, the probability is he is actually dying—unless it be a case of acute fever. The old practitioners take in these different conditions at a glance: but it is an educated glance!

Then if the patient be sitting up in bed, breathing with difficulty, there is serious thoracic disease present ; unless it be some abdominal fulness preventing the descent of the diaphragm. The attitude assumed is worth noting. There may be a distinct reason for his lying upon one side : on the right side with an enlarged liver, on the left side (probably) with a pleuritic effusion. Remember what has been said before (p. 70) ; the upper side of the thorax is 'the working side' when a patient is in the recumbent posture ; and there must be some strong reason of some kind, be it what it may, for it, if the upper side is extensively diseased (or the thoracic space of the upper side much impaired).

Then often the accessory muscles of respiration in the neck can be seen playing vigorously, while the abdominal character of the respiration is clear through the bedclothes, as in extensive emphysema. To note these different matters is to learn much about the patient's malady ; as well as the extent to which he is ill.

Then take a note of the manner in which the patient speaks. If the respiration be greatly embarrassed, the patient will 'take a breath' before attempting to speak ; while utterance will be perpetually arrested in order to breathe. In cerebral exhaustion, whether acute or chronic, the utterance is slow and deliberate. Sometimes the patient affects to be much worse than he or she actually is, and then the speech is very suggestive ; it becomes often quite an effort to speak, and the eye notes that the features do not tell of such utter exhaustion. The evidence furnished to the ear and the eye does not tally. Often, too, the firm feel of the hand contrasts with the languid grip. Once put on his guard, the practitioner can feel his way.

If there is a cough, take an observation of it. The râles of bronchitis can often be heard when the phlegm is loose, and comes up readily. At other times the patient sinks back exhausted after expectorating a little pellet of phlegm ; while the phthisical patient has paroxysms of coughing,

usually leaving him also exhausted, and with the face bedewed with sweat. In pulmonary vascular congestion there is a dry cough, as in mitral disease.

When there is abdominal pain, there is a frown upon the brow; when the pain is severe at times, there is a twitch upon the features (p. 16).

In rheumatic fever the patient gives, vividly often, the impression of helplessness, lying with a look of resignation on the face; while the arms show swollen wrists and hands, stiff and useless.

In phthisis, the patient's eye will often follow everything that is going on in the room with quick restless gaze.

When the head is affected, it is either rolled about or held betwixt the hands; often a damp cloth is seen over the forehead, but this is more common with sick-headache than with actual disease, as meningitis.

When the patient is very ill, he is usually subdued. When, then, the patient is fretful and irritable, constantly finding fault and complaining, either he is not gravely ill, that is, not in immediate danger, or he is convalescing; two indications that are worth remembering in connection with convalescence. When the patient is struggling with the malady, he is too absorbed to reflect on his feelings; but when the corner is turned, he begins to feel how exhausted he is, and his constant complaint is how tired, or weary he feels. When, then, the patient's complaint takes this direction, it usually tells that the battle is won—so far. The next is this: when very ill, he takes what is given him quietly, or rejects it with a significant gesture; but when the patient begins to criticise his food, especially in a hostile spirit, it tells that he is no longer either struggling for life, or feeling exhausted; but is once more strong enough to wrangle.

There are some other matters also to be noted. For instance, the patient may be motionless, as after a stroke, or in uræmia, or perhaps asleep; but it will be an ab-

normal sleep that does not yield to the entrance of a medical man, especially if it be his first visit. Or the patient may be seen with gouts of blood near the mouth from hæmoptysis, which returns with every attempt to speak, or only on cough in slighter cases; or he may be in apparent collapse from hæmatemesis. Here what the eye takes in is quite as valuable diagnostically as anything that may be elicited by questions, or gleaned by physical examination; indeed, in hæmoptysis and hæmatemesis the less of this last, perhaps, the better.

Then there is 'the typhoid condition,' thus graphically described by Tweedie:

'It is announced by the decline of the previous more acute symptoms; by the pulse becoming more rapid and soft, the tongue dry and brown, tremulous, and protruded with difficulty; by the incrustation of the teeth with sordes; by the increasing intellectual disorder, indicated by the more constant low muttering delirium, and the greater insensibility and deafness; and by the condition of the muscular system, evinced by muscular tremor, and sub-sultus tendinum, and in some cases irregularity or intermission of the pulse, by the patient lying sunk on his back, or sliding to the foot of the bed, the muscles being unable to support the body even in the horizontal position.' About the last he says: 'The prognosis may, in some measure, be formed from the posture of the patient. When an individual labouring under fever is able to change his position, and to retain it for any length of time, it is a favourable circumstance, showing that a degree of muscular vigour still remains, and that the powers are not unduly exhausted.'

On the other hand, if the patient have slept and be easily roused; if the eye brighten, and the countenance recover its expression; if the tongue be cleaner or moister; if the skin be moist with a warm general perspiration, then the patient is improving.

And what is said here of 'the typhoid condition' applies to conditions of 'uræmia.' Whenever a high temperature is maintained for some time, the nitrogenized tissues melt down, and then the typhoid state follows. Old physicians talked of maladies 'turning to typhus fever,' an expression yet heard at times; what is really to be understood is a typhoid condition becoming developed, from the kidneys being overwhelmed by the amount of nitrogenized waste in the blood.

This involves a matter upon which a few words may be said. It has been just alluded to at p. 160, and that is, the consequences of a sustained high temperature. Under it the tissues melt, and especially muscular fibre. The fibrillæ lose their striæ, and become waxy cylinders, with a tendency to break up into mere *débris*. Nor is this a pathological change found only in the dead; by the harpooning of muscles it has been demonstrated to occur in those who survive, and get well. The consequence of this tissue-wasting is that a large quantity of nitrogenized *débris* is thrown into the blood, and cast out by the kidneys. Probably owing to the high temperature, the form assumed by this waste is the soluble urea. Consequently the specific gravity of the urine is high; the amount of urea present being twice or even three times the normal amount (400 grains). If congestion of the kidneys occurs, then the output is interfered with, and the typhoid, or uræmic condition is set up. Its semeia have been given before (p. 235), and need not be recapitulated. Looked at diagnostically, that is, from the point of view of the amount of danger in which the patient is involved, this condition is graver the older the subject, and the greater the liability to degenerative change. If the urine be albuminous, and still more if bloody, there is congestion of the kidneys; and the danger to life from arrested output is imminent. The tongue, too, is a great guide: if it becomes drier, browner with fur, cracked or fissured, and like a brown ball, while sordes

gather on the teeth, the case is becoming gloomier; if, on the other hand, the tongue become moist, and there is a tendency to shed the brown fur, the prospect is brightening. The same may be said of the consciousness. If it become more and more clouded, with low delirium, the typhoid, or uræmic condition is being firmly established, with death behind it. If it lighten up like the lifting of a cloud, hope beams beyond it. The therapeutic management of this condition will in certain cases exercise a profound influence over it, as in the typhoid condition of specific fevers in previously healthy persons; while in old-standing kidney mischief our power is more limited. Still in all cases we can be of less or more service, and should try what can be done, first to lower the pyrexia, upon which the condition of tissue-wasting depends; and secondly to help the system to cast out the waste. The absence of these evidences where the temperature, when taken, is habitually high, tells that this is really due to neurosal derangement (see p. 160). If the temperature was persistently as high as it was at the time of observation, the effects of the pyrexia upon the tissues would be obvious.

‘Picking the bedclothes’ is a phenomenon justly dreaded. It tells that the intellect is deeply clouded and the eyesight failing. When a patient with fever gets to the length of picking the bedclothes, and still more if petechiæ show themselves, he is in the gravest danger—in ‘the valley of the shadow of death’ in stern reality. The death of Sir John Falstaff is vividly sketched: ‘After I saw him fumble with the sheets, and play with flowers, and smile upon his fingers’ ends, I knew there was but one way; for his nose was as sharp as a pen, and a’ babbled of green fields. “How now, Sir John?” quoth I. “What, man! Be of good cheer.” So a’ cried out—“God, God, God!” three or four times. Now I, to comfort him, bid him a’ should not think of God: I hoped there was no need to trouble with any such thoughts yet. So a’ bade me lay more clothes

on his feet. I put my hand into the bed and felt them, and they were cold as any stone; then I felt his knees, and they were cold as any stone; and so upward and upward, and all was cold as any stone.'

There are other forms of death, as the statuesque position with the *facies Hippocratica*. Here the nose is pinched, the jaw drops, which leaves the mouth open; the eyes are sunken (the corneæ being dull, having lost their transparency), but are open; the temples are hollow; the ears shrunken; while the skin is pale and leaden-looking, or livid.

Or again, the peculiar *tout ensemble* of carbonic acid poisoning, the terminal phase of mitral disease, and other maladies involving the respiration. The desire for sleep is intense; and the patient drops off, to be wakened abruptly by dyspnoea, or may be a horrid dream. The patient fears to sleep, yet is unable to resist the overpowering drowsiness and drops off again—to be awakened by something horrid; till at last he wakes no more.

Then there is the Cheyne-Stokes respiration described at p. 63.

Then the patient may be lying flat and unconscious, with the stertorous breathing of apoplexy, or the hissing breathing of uræmia. When there is a clot in the brain pressing upon the medulla the breathing is interfered with; and when this occurs it is clear a little further pressure will abolish the respiration altogether.

Such, then, are some of the final scenes.

There are some other matters it is well to note, as a severe abdominal pain, for instance.

If the patient be lying flat, with the knees raised, so as to relax the abdominal muscles, and also to keep off the weight of the bedclothes, then there is peritoneal inflammation present. When the patient is rolling about in bed, it is colic, and pressure gives relief; which is attained by pressing the belly on the bed, or laying the hands on it. If

a young woman, it may be dysmenorrhœa. In hysterical peritonitis, if the patient's attention be drawn elsewhere the hand may be pressed upon the belly without attracting attention; but if the patient be cognizant, the slightest touch is agony unspeakable.

If the patient be tossing about, more or less unconscious, with blanched features, then severe hæmorrhage is present.

When the patient is propped up with laboured breathing, this 'orthopnea' tells of grave cardiac or thoracic mischief; aggravated by flatulence or other cause of impediment to the descent of the diaphragm.

In asthma the shoulders are fixed, and the breathing is forced and voluntary.

It is good practice to walk round a large ward and study the attitudes of the patients in bed. A little of such systematic observation would be of priceless value to a young man about to enter practice. The wards of our large parochial infirmaries are admirably adapted for such observations; and a few visits to them will amply repay the time so spent. Especially valuable is such observation in the matter of diseases affecting the respiration. In phthisis and pneumonia there is the hurried respiration, often with the pink flush upon the cheek, which contrasts with the cord-like muscles of the neck, and the abdominal respiration of emphysema, with or without bronchitis; and along with these the heavy breathing of cardiac failure, either with the purple lips, or the more diffused 'mitral flush' on the cheeks. It is well, too, to familiarise the eye with the postures assumed in nervous affections involving more or less paralysis.*

When the patient is obviously very ill, yet is in an arm-chair instead of being in bed, he is usually the victim of some valvular, or other cardiac disease; or some other disease which will not allow him to breathe in the recumbent posture.

* If the reader could go round with Dr. Lloyd, of the Lambeth Sick Asylum, he would profit much as to such observations.

When a patient is found in bed, yet not presenting indications of severe illness, it is just as well to inquire why he is in bed ; because one naturally associates being in bed with serious illness. Probably the answer will be that the patient went to bed to admit of complete physical examination. This is one outcome of the present exclusive admiration for, and belief in physical examination. Now, to me at least, such action is rather misleading than otherwise ; just as is the behaviour of some nurses who strip the patients when the physician is going round. Personally I am not in the habit of making the acquaintance of my patients in a nude torso, and such act 'throws me out.' Of course, for those physicians who do study their patients in the nude, such action is right and proper ; and the nurse is taught to do it somewhere, else she would not do so. The nearer the appearance of the patients to that of other people, the less the difficulty of studying them with the eye. Consequently, if a patient is not so ill as to be compelled to stay in bed, it is well to see him in his usual clothes first ; and then send him to bed, if desirable. So with patients in a ward ; it is well to see them in their bed attire first, and strip them when the time comes. The diagnosis is not to be made by physical examination ; it is to be completed by it ! The physical examination is the apex of the diagnostic cone, or pyramid : not its base. To examine for the disease before examining the individual in whom the disease exists is like an inverted pyramid ; ridiculous, if not unsafe.

The observations to be made day by day upon the patient in bed are numerous, often minute. The condition of the tongue, the urine, its bulk and character, often the stools should be examined carefully. The sleep, the appetite, often the cough, and the patient's feelings should be studiously and systematically inquired after. Night sweats should never escape notice ; their oncome, their departure, their increase or decrease, are always matters of importance. Any new attitude, whether involving less muscular power,

or more strength, should be recognised. So should any clouding, or brightening of the countenance. If the patient be in clean clothes, and bears evidence of having been washed, this is always a good sign; unless the nurse is a headstrong fool, and then such evidence of meddling may mean that the patient is to be all the worse of the chill and the disturbance.

Careful observation of the invalid and his surroundings will often tell much in itself, as well as give direction to the inquiries. If the medical man can put his questions aptly, it shows that he knows what he is about, and increases the confidence reposed in him; which last adds greatly to the likelihood of his orders being obeyed. And, youthful reader, let me tell you that that is an important factor in diagnosis, *i.e.*, of diagnosis in its prognostic aspect.

If the patient be surrounded by nurses without experience, who either disobey orders, or act upon their own judgment, the prospects of the patient are much darker than would be the case if the nurses were better fitted for their places. Often something has been done that is prejudicial to the patient; and the doers wish to conceal their deed from the doctor: here the offenders will usually lead off with some loud complaint against the medicine, or the orders; or otherwise 'get the first word,' and lure the doctor away from suspecting anything. And such attitude among ignorant persons is at once suggestive that there is something to be concealed. Consequently it is well, in giving an opinion as to the probable future of the case, often to append the rider—'Provided the orders are strictly obeyed. If they are deviated from in any way, my opinion does not hold as to the result.' This is especially called for where the issue is doubtful, and the opinion hazarded is favourable. The very persons who by their neglect or their meddlesomeness falsify the opinion, and do detriment to the patient's prospects, are the very first to taunt the doctor with having made a mistake. But if they have been made

clearly to understand that the opinion given is based on the presumption that the orders are strictly carried out, and they are not carried out, or something has been done that was not ordered, then the doctor can rebut their charge; and point out what was done, if it come to his knowledge, and what the consequences were.

Two classes of persons make untrustworthy nurses: (1) the fussy, meddlesome, often kindly hearted, well-meaning persons, who are pretty certain to perpetrate 'sins of commission;' and (2) those who say 'yes' to everything, and who never take the trouble to be sure that they have caught your meaning correctly, and who are very likely to commit 'sins of omission.' In a doubtful case always test your nurses, if you can, before you hazard your opinion; and when you indulge in a favourable opinion, look after your nurses watchfully; else your prognosis may not be verified from avoidable causes.

Also, and this is said in all humility, please remember that the treatment often exercises a profound influence upon the case. The treatment may be inefficient, injudicious, or injurious; and the patient is sometimes in more jeopardy from his treatment than his malady (and this is apt to be true of the employment of opium, or chloral, ignorantly rather than recklessly).

'The treatment of diseases rightly considered is, in fact, part of their pathology,' wisely said Peter Mere Latham. There may be a lethal factor in the medicine-vial, which does not reveal itself in the dead-house. The patient may drop into a grave never dug for him by nature. It is perilously easy, at times, to verify a bad prognosis.

For instance, the first serious case which came under my charge after gaining a diploma was that of a severe diarrhoea in an anæmic woman. She was evidently very gravely ill, and vigorous measures, opiates and astringents, were requisite to overcome the diarrhoea. At last success was attained; but in some six-and-thirty hours after the cessation of the

diarrhoea, uræmia set in and was soon fatal. On inquiry of my father, who had been away a few days, it turned out that the woman was the subject of well-marked Bright's disease with albuminuria. Of course it was unfortunate that the treatment had been so vigorous. Left alone, possibly the case would have pulled round by the efforts of nature; as it was, I did my honest best to thwart her processes with an untoward result. This is an instance in point of the statement made above, 'The patient is sometimes in more jeopardy from his treatment than his malady.' Had I been in possession of the knowledge that chronic renal disease existed, possibly a different plan of treatment might have been adopted, with a less unfortunate result.

Then again there is the subjective attitude of the patient, a matter closely allied to temperament, spoken of before (p. 225). If the patient be convinced the malady will be fatal, a very poor stand is made usually; and he quickly succumbs, if the malady be at all serious. On the other hand, there is the effect of hopefulness, or strong motive to live. Some women with a good family history and a strong motive, as a number of children to live for, will outlive almost any storm of illness; and only go down when there is no possibility of the disease being thrown off, as cancer, for instance. And a 'good family history' is a very important matter indeed in the prognostic aspect of diagnosis. Some years ago I was hastily summoned to see a case where the typhoid condition was present, the temperature 103°, and the urine highly albuminous; and the ordinary medical attendant and an eminent provincial physician had abandoned all hope. Knowing something of the family history of the patient, and their remarkable power of endurance under disease, I set to work to see if there was any local explanation of the general condition. Nothing could be found. A favourable prognosis was given, and the patient was put on antipyretic remedies with an excellent result. It really was 'the catamenial week of the

mensual cycle' (p. 170), a matter which no practitioner learns except when a case actually comes before him. The lady is now in superb health, and has been ever since she rallied from her hairbreadth escape.

On the other hand, when the family history is bad, it is well to be very guarded. In the north of England families in this respect are likened to wood; one family is spoken of as 'tough,' another as 'nashy' ('crashy'), *i.e.*, 'brittle': no bad comparison. 'Tough' people only die under the onslaught of lethal disease; while 'brittle' persons snap readily under the strain of disease. If by any possible means, reader, you can arrive at some account of the family history in a grave case, do so; the information may be of cardinal value to you in helping you to shape your opinion.

And now a word as to 'going to bed,' or 'remaining in bed.' When ordering a patient to keep his bed, often urgent remonstrances are put forward in something like this form: 'But won't it weaken him to stay in bed?' There is a strong impression abroad that to remain in bed is weakening, and that to get the patient up a while is strengthening. Probably in convalescence after acute disease, as a specific fever, or in recovering after parturition—the two conditions of acute confinement to bed with which lay persons are most familiar—such a view is far from incorrect. But as applying to many cases of debility it is absolutely false. Instead of gaining a little strength day by day, it is expended in attempts to get up. What would be thought of a person in debt to a certain extent if, instead of saving a sum daily till the amount of the debt is reached, that daily amount were squandered uselessly? Why, the debt would never be reduced! So it is in some forms of illness. The patient may keep his bed until he is strong enough to get up with profit, which day will come, sooner or later. Hospital patients, as a rule, are as anxious to leave their beds as a lunatic to get away from an

asylum ; the exceptions being thoracic cases where all effort is painful from shortness of breath—these last patients usually are only too thankful to remain at rest. Often, too, especially with well-marked anæmia, cases will not improve while going about, as servants trying to do their work, etc., which commence to improve at once when sent to bed. One well-remembered case in point strikes me. When assistant-physician to the West London Hospital, a case of anæmia in a young nurse-girl came under notice. The girl was a willing servant, and her mistress was much interested in her. Fourteen weary months she was under my care, taking every combination of tonic and chalybeate, without improvement—barely holding her ground. She went into the hospital and was kept in bed, when she commenced to improve at once under an ordinary iron mixture. My surprise at finding her in the hospital was increased by the fact of the immediate improvement there made, when all my earnest efforts had been futile so long as she was trying to work. The lesson was not thrown away, and further experience has only graven the impression deeper. When you have a case of debility to deal with, take into your calculation the matter of whether the patient is able, or willing to go to bed : you will find what has just been said to hold good of almost every case of debility. To reduce the ‘body-expenditure’ below the ‘body-income’ is the only method by which a ‘physiological capital’ can be acquired. It differs no whit from a monetary capital in the means by which alone it can be secured.

Such matters as these spoken of are at times of greater significance than the revelations of the stethoscope, or any *bruit de diable*; while at other times the physical examination gives the clue to the right line of treatment to take, as in thoracic embarrassment from pleuritic effusion, for instance. At times it is the diagnosis of the individual, rather than the nature or extent of his malady, which is our first duty, as in apex-consolidation, for instance : the

matter of the presence, or absence of moist râles being what the stethoscope can tell—and it only; and then if they are present, it is the patient we have to treat, not the softening tubercle. Still the matter of moist râles being heard will often put the observer on his guard; and yet here again the physiological factor of the temperature is required to tell whether the moist râles indicate softening tubercle, or localized bronchitis. In fact, the physical signs and the physiological disturbances have to be read together for the correct interpretation of any complex case. The men of old trusted to the latter; because they knew little of the former, in internal disease. Now men are taught physical signs most carefully, almost to the exclusion of the other moiety. Many men can detect minute matters connected with physical examination, yet cannot put their data together to spell anything. It is like the game of ‘Word-making’—so many letters, constituting a word, are mixed up and then given out; and the game is to put them together, so as to find out the word, which requires time and practice as well as pains for success.

In my own personal experience the case which completely puzzles the ordinary newly passed man is that of some emphysema with bronchitis, and an enlarged right ventricle. He cannot make out the latter by percussion, on account of the emphysematous condition of the lung over the heart (the free anterior edge of the lung being usually the first part to be affected, and in most cases it keeps its lead); and so misses the important factor of the case as regards its treatment. Usually he looks helplessly at the patient, unable to see his way. Yet, if he examined the patient physiologically, that is, caused him to make an effort and noted the results, the nature of the case and the line to take would be revealed to him like the unrolling of a scroll.

Children.—There are some points to be noticed about infants of great importance, of more importance compara-

tively than in adults, because the infant cannot tell you what it feels, the great matter ; and cries so, that any auscultation is, usually, simply impossible. When a child cries without ostensible cause, strip it naked ; a pin in its clothes may be the cause of its discomfort. If it has got colic, it will kick its little legs against its abdomen. Often you can feel the hard bowels full of wind, with the circular fibres contracting on it. Some children seem to feel the vermicular action of their intestines, without any marked morbid condition being present ; and the long-drawn wail tells of the long pain, like the cry of a parturient woman—which is often the measure of the length of a uterine pain.

Then there is the hydrocephalic hand, described by Kellie, where the thumb is doubled into the palm and the fingers closed, indeed sometimes clenched over it. Often this characteristic 'hand' will put the observer on his guard where the meningeal mischief is masked by some other more obvious morbid condition, as bronchitis. Few men get far in practice without stumbling on, or over may be, this complex condition. Then the actions of a child often tell much. If a male child pull his prepuce, you may look out for a vesical calculus. If a girl rub her clothes over her person, look for vaginitis. If a child pick its nose, there is usually some irritation in its alimentary canal, which is often set up by worms. When a child wets the bed at night, having acquired proper control of the sphincters, spoken of by nurses as 'giving over wetting the bed,' look for some local cause of irritation in the pelvis, which induces the bladder centres in the cord to relax the sphincter ; commonly it will be found to be 'seat-worms,' or an anal fissure, etc. When a child is abnormally quiet, it either suffers pain when moving, as a broken bone or other osteal trouble ; or it has no breath to spare, as in thoracic disease, notably rickets ; or it has lost all interest in its sports, as in chronic hydrocephalus. Young doctors are rarely credited with much knowledge about children ;

and the opinion of an experienced woman is usually preferred. Nor was this attitude unjust up to a recent period; nowadays, every thoughtful student attends a children's hospital for a time, and learns something about children. Children require a keen educated eye for the recognition of their troubles; and the education is a gradual process. An acquaintance with one case usually throws a flood of light upon the next case like it which comes under notice. Some time ago a woman brought a child to Victoria Park Hospital with its little waistcoat and trousers-band fastened by tags of string, like what is seen with ascitic individuals. The application of the hand over the abdomen told at once that the disease causing the enlargement of the belly was an amyloid liver. Having a great deal to do, no further examination was made, and a prescription was written. The woman demurred to this, protesting that the examination was insufficient to determine the disease; so she was advised to take him over to my colleague, whom I knew would make a most careful examination. Looking in upon him some time later, he was found with the child stripped, having satisfied himself thoroughly as to the nature of the disease. Mentioning my opinion of it, he said it was correct. I had spent equal pains over such cases in the past, a matter for which the woman gave me no credit; as, of course, she also could know nothing about my experience, or my apparently perfunctory examination!

The following remarks are taken from the well-known work of my colleague, Dr. Eustace Smith, on 'The Wasting Diseases of Children,' and are worthy of being 'read, marked, learned, and inwardly digested.' A careful perusal of the face is of the utmost importance: by it we may not only diagnose pain, but even its seat. Pain in the head is indicated by contraction of the brows; in the chest by a sharpening of the nostrils; in the belly by a drawing of the upper lip.

Enlargement of the belly is usually attributed to mesen-

teric disease ; yet this is very rare in children under three years of age. Percussion will quickly tell if the enlargement be due to flatulent distension ; which is usually owing to bad feeding. Mesenteric disease is not uniform ; and when the swelling of the belly is uniform, and no tumour can be felt, glandular enlargement is not the cause thereof : whatever is. If the liver is enlarged, its edge can usually be felt.

The colour of the face is suggestive. Lividity indicates a weak circulation, or an embarrassed respiration ; a waxy tint indicates syphilis ; while an earthy hue is seen in many cases of bowel complaint. Coolness and pallor of the face, with lividity of the eyelids, the lower parts of the whites of the eyes being exposed, with depression of the fontanelles, mean exhaustion, indicating restoratives. 'Snuffles' tell of syphilis ; and so do chaps and fissures of the mouth, or anus.

If the breathing is rapid, the chest should be exposed, and the unequal movements of the two sides of the thorax are significant of a lesion on the less-acting side. If the accessory muscles of respiration are active, there is probably some abdominal mischief present ; if the respiration be distinctly abdominal, there is probably some thoracic disease existent.

The cry of the infant varies much in character. In cerebral affections it is sharp, short, and sudden. In abdominal pain it is prolonged. In inflammatory disease of the lungs, and in rickets, the child is usually quiet, and unwilling to cry on account of the action interfering with the respiration. In inflammatory affections of the larynx it is hoarse, and may be whispering. In inherited syphilis it is high-pitched and hoarse. The cry of a syphilitic child is so characteristic, that a story is told of an eminent physician, a very acute observer, detecting the syphilitic element in a puzzling case, before he ever saw the child ; only hearing it cry in the next room. It is well, too, to learn to discriminate

the steady howl, or angry screech of temper from the cry of real suffering; which a little attention will suffice to do.

Then reflex excitability is destroyed by cachexia. If in a healthy child the finger-nail be drawn along the upper two-thirds of the inner aspect of the thigh, the testicle of that side is drawn close to the abdominal ring by the action of the cremaster muscle. In a cachetic child this result does not follow. Any sudden weakening of a healthy child is accompanied by reflex movements, as convulsions. 'When debility is produced more slowly the same result does not follow, and the excitability of the nervous system, instead of being exalted, is more or less completely destroyed.'

Where there is great emaciation with a furfuraceous skin there is certainly neglect; and often resort to narcotics, especially in manufacturing districts where the mothers work from home.

In examining a child it is well to go over the examination carefully step by step, so that the mother or nurse can follow it. A rapid comprehensive glance may take in all the points; but that is not enough. The onlookers have to be convinced that the observations are actually made. It is like making an examination before students; every detail must be taken deliberately in its turn. The rapid glance is only credited with utility where the experience of the practitioner is obvious from his age; and the onlookers have confidence in him. Indeed, with many persons a careful pointing out of obvious facts impresses them very favourably. But practical psychology is no part of my design. Young practitioners should not only possess the knowledge; but they should be able to demonstrate to the patients and their friends, that the knowledge is existent; else it is to be feared they will not always get credit for its possession; and this is especially true when children are being dealt with.

When the patient is encountered in the sick-room the

medical man requires quickness of observation, whether natural or acquired, even more than at other times; and the habit of careful intelligent observation is invaluable in the sudden emergencies which, from time to time, present themselves in the sick room; over and beyond obstetric emergencies, which last put the finishing touch to the medical man's education. 'Education is not mere information': it implies not only the possession of the information; but the capacity to wield it promptly. Education goes on during the whole of life; and of all men the medical man is a student. Still, it must be admitted there do exist men who regard their education as complete when the final examination is past, and who close their minds to the entrance of further knowledge; like the young lady who has completed her term at a 'finishing school.' As they are not likely to peruse this work, this remark will not wound their feelings. The man who ceases to make onward progress will soon be left behind by the crowd who do push on; of that this class may rest assured.

CHAPTER XIII.

CONCLUSION.

WHEN the practitioner has made a careful estimate of the individual before him, by the light of what has been written here, it will be well to examine into the nature and extent of his malady by careful physical examination ; *i.e.*, if it is a malady which reveals itself by physical signs. This he is enabled to do by his hospital education, and the many excellent works on 'Physical Examination' now published.

But diagnostically, prognostically, and, still more even, therapeutically, it is well to appraise the individual before making an estimate of the disease. Both must be alike calculated.

It is not successful practice to proceed at once to the latter, and omit the former. The latter belongs to strictly medical-school teaching ; the former the practitioner must, in the main, teach himself. To this end this little work will probably be helpful. At least, such is the writer's hope.

Nor must the reader run away with the impression that this work is the preaching of a crusade against physical examination ! Let that be learnt thoroughly by all means. It is the disproportionate attention paid to it as compared to other matters of diagnosis, the inordinate value of the estimate of the disease as compared to the individual—his diathesis, temperament, nutrition, etc., which obtains in the present scheme of medical education, against which a protest is here entered. It is not that the student be taught

less; but that he be taught more, really, which is here urged. Let the physical examination and the physiological factor in the case stand more upon level ground, or equal terms, than they do at present. The former without the latter, as much as the latter without the former, may be likened to a cart with only one wheel.

And now the time has arrived when the writer as a medical author must take leave of his readers. He has written voluminously; not in vain, if the sale of his works can be trusted as any valid evidence of the favour they have met with. The encouragement so given him has incited him to go on; despite the impression abroad that much writing means little practice. His books have brought him practice, each its modicum. Nevertheless, for the future his time must be devoted to the revision and enlargement of already existent works, in the new editions their sales demand. It is indeed a pleasure to write for appreciative readers; that pleasure he has tasted liberally. *Vale!*

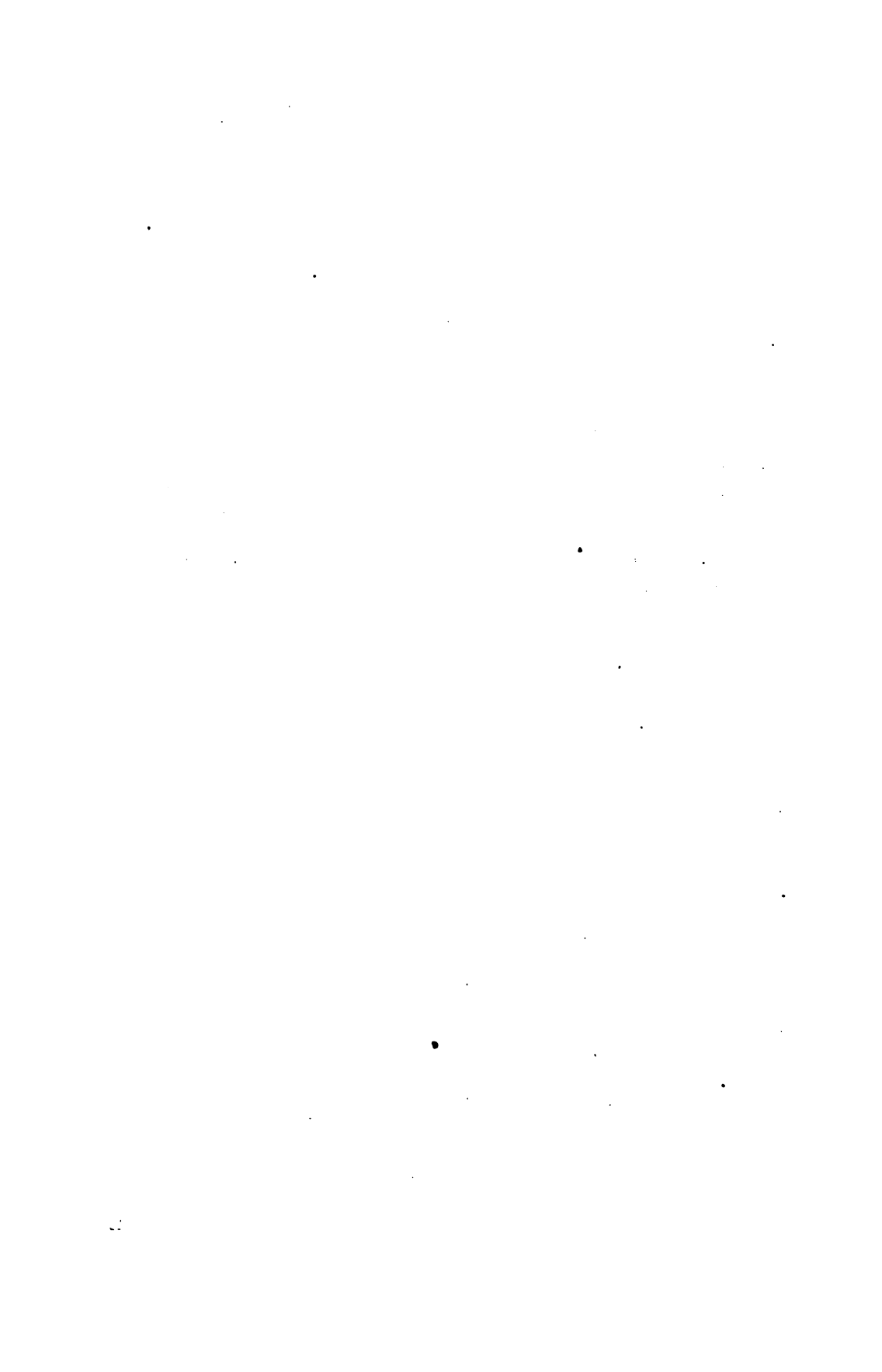
INDEX.

	PAGE		PAGE
Abdomen	30	Cough, whooping	69
Abdominal respiration	59	Cramps	193
Accelerated action of heart	91	Curves, temperature	172
Act of urination	144		
Albuminuria	133	Damp hand	32
" true and false	138	Deep respiration	58
Amenorrhœa	151	Delayed pulse	79
Anorexia	109	Diabetes	142
Appearance, external	6	Diarrhœa	119
" general	8	Diathesis, bilious	11
Appetite	105	" gouty	9
" importance of	223	" lymphatic	11
Arcus senilis	22	" nervous	10
Arrested action of heart	90	" strumous	9
Artery, temporal	37	Digestion on pulse, effects of	90
Asthma, cardiac	62	Digestion, secondary	112
		Dilatation, pulse in	85
Bilious diathesis	11	Disorders of sensations	196
Bounding pulse	79	Disturbances, trophic	195
Bowels to brain, relations of	121	Dysmenorrhœa	154
" irritable	122	Dyspepsia	111
Breath, shortness of	203	Dysphagia	101
Bulimia	110	Dyspnœa	65
Bulk of urine	125	" nocturnal	61
Cachexiæ	13	Ears	28
Calomel and opium	45	Effect of effort on respiration	60
Cardiac asthma	62	" of digestion on pulse	90
Catamenia, history of	4, 149	Eye	22
Cerebral vomiting	104	Eye-brow	21
Character of urine	127	Eye-lashes	21
Children	245	Eye-lids	21
Chin	28	Expressions	14
Cleaning of tongue	44	External appearances	3
Clothes	34		
Clubbed fingers	32	Face, vascularity of	36
Colic	114	False albuminuria	138
Collapse	164	Family history	3
Constipation	117	Fast pulse	76
" reflex	121	Fatty heart, pulse in	86
Convulsions	192	Fauces	53
Cough	67	Feet	34

	PAGE		PAGE
Flatulence	112, 118	Motor power lessened	183
Forehead	91	Mouth, roof of	53
Gait	34	Nails	33
„ nervous	190	Nausea	105
Gastralgia	115	Neck	28
Glycosuria	139	Nervous diathesis	10
Gouty diathesis	9	„ gait	190
Gouty heart, pulse in	84	Neurosals palpitation	208
Gouty teeth	26	„ temperature	160
Gums	26	Nocturnal dyspnoea	61
Hæmoglobuline	144	Nose	25
Hair	18	Observation of patients in bed	238
Hand	31	Opium and calomel	45
„ damp	32	Pain	209
„ strumous	31	Palpitation	206
Hard pulse	79	„ neurosal	208
Headache	213	Paraplegia	189
Heart, accelerated action of	91	Pharynx	53
„ arrested action of	90	Position and respiration	70
„ pulse in fatty	86	Power, lessened motor	183
„ pulse in gouty	84	Pruritus ani	116
Hemiplegia	187	Pulse	73
Hiccough	69	„ bounding	79
History of catamenia	4	„ delayed	79
„ family	3	„ dicrotic	80
„ of individual	3	„ digestion, effects of on	90
How to feel the pulse	74	„ fast	76
Hues of skin	16	„ hard	79
Hunger	108	„ how to feel	74
Hypertrophy, pulse in	84	„ in dilatation	85
Importance of sleep	223	„ in fatty heart	86
Increase of sexual power	48	„ in hypertrophy	84
Indications of tongue	42	„ in gouty heart	84
Individual, history of	3	„ in valvular lesions	81
Intermittency of pulse	88	„ intermittency of	88
Irregularity of pulse	87	„ irregularity of	87
Irritable bowels	122	„ paradoxus	80
„ tongue	47	„ rate of respiration to	57
Late rigidity	188	„ slack	78
Lips	25	„ slow	77
Leucorrhœa	156	„ tight	78
Lymphatic diathesis	11	„ unequal	91
Manner	35	„ visible	79
Matrimony	5	„ wiry	80
Maturity	4	Pulsation, venous	92
Menorrhagia	153	Pyrexia	165
		Pyrosis	114

	PAGE		PAGE
Raw tongue	51	Tongue	39, 185
Reflex constipation	121	Tongue, cleansing of	44
Reflex vomiting	104	" indications from	42
Relations of bowels to brain	121	" irritable	47
Rigidity, late	188	" raw	51
Sneezing	70	Tonsils	53
Spasms	193	Trophic disturbances	195
Stokes' respiration	63	True albuminuria	138
Stools	119	Typhoid condition	235
Strabismus	184	Unequal pulse	91
Stridor	65	Urates	130
Strumous diathesis	9	Urea	133
" hand	31	Urination, act of	144
Syncope	205	Urine, bulk of	125
Syphilitic teeth	27	" character of	127
Teeth	26	" sediments in	129
" gouty	26	Uvula	53
" syphilitic	27	Valvular lesions, pulse in	81
Temperament	225	Venous pulsation	92
Temperature curves	172	Vertigo	114
Temperature, neurosal	160	Visible pulse	79
Temporal artery	37	Voice	72
Tenderness	218	Vomiting	102
Tenesmus	116	" cerebral	104
Thermometry	177	" reflex	104
Thorax	30	Wiry pulse	80
Tight pulse	78		

THE END.



LANE MEDICAL LIBRARY

To avoid fine, this book should be returned on
or before the date last stamped below.

--	--	--

L71 Fothergill, J.M.
F77 The physiological
1884 factor in diagnosis.

NAME

53959

DATE DUE

